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Coaches' knowledge of basic injury management

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COACHES' KNOWLEDGE OF BASIC INJURY MANAGEMENT

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ABSTRACT

COACHES' KNOWLEDGE OF BASIC INJURY MANAGEMENT

by Charity Lynn Perdew

This study examined high school coaches' knowledge of basic injury management. Originally 24 coaches from the Fremont Union School District who received less than 80% on the pretest were invited to attend a Basic Injury Management Clinic (BIMC). Coaches were reluctant to participate in the clinic, therefore the BIMC was not provided. Results showed that men and women performed similarly on the sports safety test. "Walk-on" coaches scored the lowest with a mean score of 79%. Credentialed teachers with a physical education background scored the highest (91%). For the most part, coaches with more years of experience scored higher than less experienced coaches and coaches of non-contact sports scored higher than coaches of contact sports. These scores raise serious concerns when taking into consideration the rate of injury that occurs in contact sports as well as the number of teams coached by non-credentialed teachers without backgrounds in physical education.

DEDICATION

I dedicate this project to my mom, Diane Perdew, who has always supported and encouraged me to follow my dreams; and to the coaches of Sacred Heart Prep who assisted and pushed me to finish this thesis. Lastly, I dedicate this project to Buffy Romshek-DeWispelare, who first introduced me to athletics and later the profession of athletic training.

I believe Clear and Bagley stated it best "A healthy athlete is preferred any day to a victory won at the cost of a needless injury" (1983, p. 59).

ACKNOWLEDGEMENTS

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I acknowledge the high school athletic coaches for their participation, without them the project could not have been possible. Their time and efforts to better their knowledge was greatly appreciated.

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Chapter 1

INTRODUCTION

A high school football player lies motionless on the field after making a routine tackle during football practice. The player's coach had hoped an incident such as this would have never occurred, because he feared he was not prepared to handle the situation. Sometimes the injuries at the high school level are forgotten as the media focuses on the injuries and catastrophes of the Division I athlete, or more notably the NBA and NFL sports stars such as: Reggie Lewis of the Boston Celtics, Dennis Byrd of the New York Jets, and most recently Reggie Brown of the Detroit Lions.

> Brown was injured December 21, 1997 in a near-paralyzing accident during the final regular-season game against the New York Jets. He has made the kind of recovery that only two of every 100 patients have after a spinal cord-injury, said Dr. Russ Nockels, the spinal cord-injury specialist who treated Brown. His case illustrates the best outcome possible with good on-site medical attention (Anstett, March 18, 1998, p. 2).

"Brown got proper and immediate treatment on the field from Lions trainer, Kent Falb and team physician Terry Lock. Brown was kept rigid, and received mouth-to-mouth resuscitation" (Anstett, March 17, 1998, p. 5). Reggie Brown had an expertise line-up at his side of trainers, physicians, coaches and Emergency Medical Technicians (EMT). The medical specialists available for a high school team do not always have this level of professional training, thus one must determine if coaches at the high school level are knowledgeable and prepared to handle the aforementioned scenarios. Although all injuries are not as serious as this, "there are approximately six million students competing in athletics at the high school level and approximately one million of these athletes will sustain an athletic injury. Eight percent of these injuries interrupt athletic participation

for 7 days or less, while two percent preclude participation for 3 weeks or more. Approximately 36 interscholastic athletes will incur a fatal or catastrophic injury annually" (Culpepper, 1986 p. 131). Torg, Quendenfeld, Burstein, Spealman, and Nichols reported "1,275,000 of the nation's young people participated in football. From 1971 to 1975 they reported 77 deaths, 99 cases of quadriplegia, and 259 cases of either fracture or dislocation caused by trauma to the cervical spine during participation in football" (1979, p. 127).

In 1958 the Bill of Rights for the School and College Athlete was published as the first piece of work for the Medical Aspects of Sports Committee of the American Medical Association. The document reads as follows:

> Participation in athletics is a privilege involving both responsibilities and rights. The athlete has the responsibility to play fair, to give his/her best, to keep in training, to conduct himself /herself with credit to his/her sport and his/her school. In turn he/she has the right to optimal protection against injury as this may be assured through good technical instruction, proper regulation and conditions of play, and adequate health supervision (Haines, 1984, p. 8).

Injuries are inevitable in sports because of the complex, demanding nature of athletics. Bill Chambers, past president of the National Athletic Trainer's Association (NATA) stated that "coaches should have knowledge of sports medicine because some schools do not have a trainer. The districts that have trainers, have an overlap of athletic seasons and the responsibilities of a trainer off the field may force a coach to function as an emergency person in an injury situation" (Hage & Moore, 1981, p. 147).

Problem Statement

The purposes of the project were:

1. To measure initial basic injury management knowledge of high school athletic

coaches using the American Red Cross (ARC) Sport Safety Training pretest.

2. To conduct a Basic Injury Management Clinic (BIMC) using the American Red Cross Sport Safety Training program, which consists of professional lectures and practical skill sessions concerning first aid, CPR, injury prevention, injury management, and sudden illness. A posttest from the ARC Sport Safety Training course was to be administered to determine the effectiveness of the BIMC.

Null Hypotheses

The study was designed to test the following null hypotheses:

1. There will be no significant difference between the pretest and posttest scores due to the intervention of the BIMC.

2. Coaching variables such as age, level of education achieved, and sport coached will not influence injury management knowledge of high school athletic coaches.

Assumptions

"Every study has certain fundamental premises without which it could not proceed. In other words, one must assume that certain conditions will exist and that the particular behaviors in question can be observed and measured" (Thomas & Nelson, 1996, p. 56). The following assumptions were made for this study:

1. Coaches are capable of providing care to the injured athlete.

2. Techniques learned in the clinic could be easily applied to actual situations.

3. Coaches responded honestly to the demographics survey and to the pre and post knowledge tests.

4. The ARC Sport Safety Training course test was a valid and reliable measure of

coaches' knowledge with regard to CPR, first aid, injury prevention, injury management, and sudden illness.

5. Coaches were attentive and motivated to learn the materials presented during the BIMC.

6. Coaches did not take any other course in injury management prior to the BIMC posttest, thus disrupting the reliability of the BIMC as the only treatment intervention.

Delimitations

During the design of this project, certain delimitations were accepted.

1. Only coaches who attended the BIMC were tested.

2. Only coaches in the Fremont Union High School District were asked to participate.

3. Those coaches who obtained an 80% or better on the pretest had the skills necessary to handle basic injury management, thus their attendance at the clinic was not required.

4. Due to the ARC course standards for proper instruction only 24 of those coaches receiving less than an 80% were randomly selected to attend the clinic.

5. Some coaches did not attend without an incentive.

6. Coaches had to be at least 18 years or older.

7. The researcher defined type of sport based on the injury occurrences observed in the training room, and by the amount of bodily contact made.

8. The researcher categorized the types of test questions based on the severity of the nature of the question.

Limitations

The limitations of this project reflected the effect of delimitations on the collection and interpretation of the data and on the ability to expand the scope of reason beyond the sample population. Generalizations made from the results were compromised by the following limitations:

1. There were some coaches who were qualified to manage acute sports injuries, but have not had any training in over 3 years.
2. Due to the time of year for the pretest and clinic some seasonal coaches were not in attendance.
3. Those coaches receiving less than an 80% on the pretest were invited to attend the clinic, however some were not in attendance due to day, time, location, cost or they were not one of the participants randomly selected.
4. Additional information concerning injuries was possible, however, the Sport Safety Training course was used as developed by the American Red Cross (ARC) and the United States Olympic Committee (USOC) in 1997.

Definition of Terms

Over the course of the study several terms were used repeatedly. Even though the terminology may be familiar, specific definitions were developed for use in this study. The definitions are as follows:

Anatomy: The structure of the body, or the study of body structure (Hafen & Karren, 1993).

Athlete: A person trained to compete in contests involving physical agility, or strength: a trained competitor in a sport, exercise, or game requiring physical skill (Urdang & Flexner, 1973).

BIMC: Basic Injury Management Clinic which involves the ARC Sport Safety Training material covering CPR, first aid, injury prevention, injury management, and sudden illness.

> Certified Athletic Trainer: "Is an allied health professional who has fulfilled the requirements for certification as established by the NATA Board of Certification. The Certified Athletic Trainer works under the direction of a licensed physician when practicing the art and science of Athletic Training, which includes the following domains: 1) Prevention of Athletic Injuries; 2) Recognition and Evaluation of Athletic Injuries; 3) Management, Treatment and Disposition of Athletic Injuries; 4) Rehabilitation of Athletic Injuries; 5) Organization and Administration of an Athletic Training Program; and 6) Education and Counseling of Athletes" (Drowatzky, 1985, p. 10).

Coach: A person who trains an athlete or a team of athletes (Urdang & Flexner, 1973).

CPR: Cardiopulmonary resuscitation (Hafen & Karren, 1993).

EMS: "Emergency Medical Services System is a chain of services linked together to provide care for the patient at the scene, during transportation to the hospital, and upon entry at the hospital" (Bergeron, Bizjak, & Wall, 1994, p.108).

> First Aid: "The care given to an injured or ill patient, usually where the victim was injured or became sick. It is the initial care given to the victim before medically trained people arrive or before the victim arrives to a health-care center. Attention is given first to the most critical problems: opening of an airway, the presence of bleeding, and heart function. The patient is kept warm and as comfortable as possible. The conscious patient is reassured and is asked for details of medical history, such as diabetes, a known heart condition, or allergic reactions to drugs; if the patient is unconscious, a medical identification card, bracelet, or necklace is looked for. The patient is moved as little as possible, particularly if there is a possibility of broken bones. If there is vomiting, the

patient's head is moved to a position for the vomit to exit easily to avoid having the patient breathe in the vomit" (Glanze, Anderson, & Anderson, 1992, p. 320).

Good Samaritan Laws: "Law written to protect emergency care personnel which require a standard of care to be provided in good faith, to a level of training, and to the best of ability" (Hafen & Karren, 1993, p. 521).

Injury: "Any event that altered the ability of a participant to compete or practice in the usual manner. A major injury is one that altered play for 7 days or more. If fewer than seven days were lost, the injury was considered minor" (Shively, Grana, & Ellis, 1981, p. 47).

Type of sport:

Contact: A sport in which bodily contact is made with the opponent and a high number of injuries occur as a result (basketball, football, and soccer).

Low contact: A sport in which intermittent bodily contact is made with the opponent, with some injuries occurring (baseball, field hockey, softball and water polo).

Non-contact: A sport in which bodily contact is very limited, with few injuries occurring (cross country, golf, swimming, tennis, track, and volleyball).

Type of test questions:

Life-threatening injury: Any injury that would put the athlete's life in jeopardy or may be a fatal response to the injury.

Neutral sport injury: Involved those injuries where the athlete may not be in serious risk of harm, but responding incorrectly could worsen the existing condition, but without risk to the athlete's life.

Non-life-threatening sport injury: Involved those injuries where the action taken would not hinder the sick or injured athlete.

Justification for Study

A 14-year-old high school sophomore was fatally injured while participating in a practice scrimmage on August 25, 1982. He was tackled in a head-on collision while carrying the ball on a kickoff. He collapsed and lost consciousness after the play and died on August 28, 1982. He was reported as having his "bell rung" in a scrimmage on August 6, 1982. Cause of death was a subdural hematoma.

On September 10, 1982, a 17-year-old high school football player was tackled after catching a pass. He fell to the natural turf hitting his hip first, shoulder second, and head last. He died September 15, 1982, from a head injury as a result of his head hitting the ground after the tackle. It was noted that earlier in the season he was struck in the head by a ball that gave him a headache and he was hit in the head during a scrimmage and was dizzy for a short time.

A 16-year-old high school player was seriously injured in a game while being tackled. The injury took place on October 22, 1982, and after being in a coma, died on October 28, 1982. Cause of death was a subdural hematoma.

A 14-year-old high school athlete was kicked in the stomach while making a tackle in a game on October 23, 1982. The player was helping on a tackle and as he approached the ball carrier the legs of the ball carrier swung around and hit the player in the stomach. The player was not in pain and went about normal activities after the game. Six hours after the game, the injured player died from internal bleeding that led to congestive heart failure.

On October 28, 1982, a 17-year-old high school junior varsity football player received head injuries in a game. Information as to how the accident took place was not available. He died on October 30, 1982.

A 17-year-old high school football player died on October 31, 1982, after receiving a head injury in a game. The injured player was making a tackle and his head made contact with the thigh of the ball carrier. He was playing defensive back and tackling the pass receiver in the open field. Cause of death was a subdural hematoma.

On November 6, 1982, a 16-year-old high school football player died of a subdural hematoma received in a football scrimmage on October 25, 1982. The injured player was a linebacker making a tackle.

On August 19, 1982, a 13-year old middle school student died from heat stroke. The player was practicing in full uniform and the temperature was 90 degrees. Humidity information was not available. Practice

> involved two 45-minute work periods with a 15-minute water break between the work sessions. The injured player was reported as not having any water during the break. He collapsed in the locker room after practice, was packed in ice, and taken to the emergency room.
>
> A 17-year-old high school football player died on August 27, 1982, after a severe asthmatic attack led to cardiac arrest.
>
> A 15-year-old high school football player died in August 1982, when he collapsed and died after hitting a blocking sled. There were no warning signs and the medical examiner said the heart just stopped pumping.
>
> On October 15, 1982, a 17-year-old high school football player died from natural causes related to the heart. He had a breathing problem while standing on the sidelines at practice after being involved in stretching and warm-up drills.
>
> A 14-year-old football player died on August 24, 1982. He collapsed during a run in practice and died in the emergency room from cardiac arrest.
>
> A 17-year-old high school football player died on September 24, 1982. He took himself out of the game with one minute left and complained of blurred vision. He collapsed in the locker room. The autopsy report stated it was not a specific injury but was due to a congenital blood vessel defect in the brain (Mueller & Schindler, 1983, p. 325-326).

These real life cases of athletes' death may have been prevented if coaches were better trained in how to recognize the signs of a life-threatening emergency. "It has been estimated that less than 10% of the nation's 22,000 high schools provide adequate medical care for student athletes" (Culpepper, 1986, p. 132). When considering coach's educational preparation, are they really prepared to adequately manage athletic health care, or are school administrators, parents and the medical community pressuring coaches into a position of liability that they remain unqualified to assume?

Significance of the Study

This study was significant in that it not only tested a coach's knowledge of the prevention and care of athletic injuries, but the study also assumed responsibility in helping coaches that did not meet the qualifications by providing a clinic to educate the

coaches in the areas in which they lack knowledge. Based on previous research, there were limited studies that used this type of intervention. Many studies to date have measured a coach's knowledge concerning athletic injury and discussed the ramifications of how knowledge or lack of knowledge affected the athlete, parent, coach and school. Some studies offered views on how to improve the knowledge base of the high school coach, but few implemented ideas to determine their effectiveness.

The majority of the research studies dealing with coach's knowledge of athletic injuries used male coaches in the early to mid 1980's. Little research has been completed recently. This was possibly due to the recent increase in safety oriented rules added to sports to make them safer as well as the increased number of certified athletic trainers employed in the high schools. Coaches assuming the role of the certified athletic trainer have done so because the school did not have a certified trainer on staff or because the certified athletic trainer on staff was not readily available. Since certified athletic trainers oversee all sports in a given sport season, they may have been traveling with a team, covering one of several concurrent practices, or taking care of an injured athlete, which did not allow the athletic trainer to be present at another site where an injury may have occurred. Therefore, non-certified athletic training personnel (coaches) might have been required to serve in the professional capacity of the certified athletic trainer. Taking this into account, coaches must be prepared at all times to handle an emergency medical situation. There is a continued need to assure that today's coaches, male and female, can respond to an athletic injury or athletic emergency in a knowledgeable and effective manner.

Chapter 2

REVIEW OF LITERATURE

The majority of the literature reviewed demonstrated that there was a need to improve the existing level of health care for the high school athlete. Having recognized, among other items, the dramatic injury rate in high school athletics, and the lack of medical support for these injuries, coaches need to be more knowledgeable and prepared to handle an injury situation. This chapter highlighted research in the areas of first aid knowledge and confidence, coaching requirements, liability issues, and model programs for injury management.

First Aid Knowledge and Confidence

"Professional incompetence is a phenomenon of today's society. The accelerating pace of new information, advances in technology, and changes in educational, social, economic, and political institutions have made it increasingly difficult for professionals to keep abreast of development" (Rowe & Robertson, 1986, p. 116). Today's coaches need to re-educate themselves in order to stay on top of the management of athletic injuries. Researchers claim four items are drawing a closer inspection of coaches. Items include: 1) increased participation in high school sports, 2) pressure from school administrators, parents, and medical professionals to reduce the rates of injury and improve medical care, 3) court decisions that have increased the vulnerability of school districts to law suits from sport injuries, and 4) smaller school district budgets that force operation under less than ideal conditions (Rowe & Robertson, 1986, p. 116). In their study Rowe and Robertson determined the knowledge of care and prevention of athletic injuries in

Alabama high schools. Coaches comprised 88.9% of the sample. Of these coaches, 58.2% held degrees in physical education. The percent of individuals meeting the criteria level of passing (70%) for the six categories of anatomy, care and prevention, conditioning, diet/nutrition, equipment, and heat related factors, was an alarming 27%. This means that 73% of the 127 individuals tested, who are responsible for the care and treatment of injured athletes are making incorrect decisions on the health care of athletes 70% of the time. This should be of major concern for parents of athletes, as well as school personnel.

Joseph Kenny completed a follow up study in 1987 with a questionnaire to determine how skilled high school coaches and physical educators were within the realm of injury management. The questionnaire was distributed to a large sample size of 478 coaches in Southern Ontario high schools. The results show that 60% of coaches were not comfortable handling serious injuries and of the 40% that do feel comfortable, less than half actually had the qualifications to do so. This means that fewer than three out of every ten high school coaches have a minimally acceptable level of training related to sports injures. The seriousness of the situation is easily noticed when 28% of the coaches surveyed had reported a life-threatening injury while they were coaching. The coaches with the highest level of training were the coaches of the youngest age group. Almost all of the coaches (93%) said they were interested in taking a sports injury course. Thus Kenny recommended that coaches enroll in continuing education programs or that school boards hire an individual to provide injury care required.

"We tend to assume the coach can competently care for the injured athlete"

(Rowe & Miller, 1991, p. 49). Rowe and Miller found otherwise by distributing the Modified Inventory of Recent Knowledge in Physical Education survey to 441 coaches in Georgia. Their survey consisted of a 30-item inventory of six areas: anatomy, care and treatment, conditioning, diet/nutrition, equipment, and heat related factors. Based on their results, Rowe and Miller stated, "A close examination of segmented scores should cause concern for administrators, coaches, athletes, and parents" (1991, p. 52). These segmented average scores were as follows: anatomy 52%, care and treatment 41%, conditioning 61%, diet and nutrition 88%, equipment 51%, and heat 73%. The survey revealed that 62% of respondents responsible for the care, treatment, and rehabilitation of injured high school athletes in Georgia do not possess adequate athletic training competencies. Only 38% achieved a passing score of 70% on the questionnaire.

In 1984 Stapleton, Tomlinson, Shepard, and Coon completed a study to determine coaches' perceptions of their responsibilities in managing athletes' injuries. Thirty coaches were interviewed from the South San Francisco Bay area. The interview consisted of six open-ended questions regarding athletic health care. The results concluded that the coach is the athlete's first contact concerning an injury. Only one fifth of the coaches went beyond this initial viewing of the injury by coordinating medical services for the athlete. The interview indicated that coaches felt uncomfortable when dealing with injury management. The uncomfortable feelings are as follows: 29% of soccer coaches, 66% of football coaches, 88% of volleyball coaches, and 50% of basketball coaches attributed this uncomfortable feeling to a lack of knowledge when handling athletes' injuries. Half of the coaches recommended that a prevention and care

of injuries course be taken to assist in easing the uncomfortable feeling. Data suggested that athletic health care at the high school level should be upgraded, and more health care professionals need to be involved in assisting coaches in furnishing athletes with the best health care.

Coaching Requirements

Haines (1984) stated "From a legal standpoint the coach is obligated to render emergency care should the need arise. The team physician or trainer cannot be everywhere at once" (p. 9). With this in mind the coach must be able to play the role of the athletic trainer. Coaches should be aware of the possible injury patterns involved in their sports and ways of preventing these injuries.

> There has been a legally defined duty of the coach toward his/her athletes and the team. In an emergency situation the coach must do the proper thing. By virtue of the position held, the coach is expected to exercise a certain standard of care in all actions involving the welfare of the athletes. The welfare of the athlete would obviously include first aid and emergency care. The coach cannot plead ignorance of safety factors and first aid techniques. (Haines, 1984, p. 9)

A coach is obligated to render emergency care should the need arise; therefore there is a need for educating coaches. Minimally all coaches should be first aid and CPR certified, but data shows that this is not always the case in some school systems. The coach must recognize the situation and have basic knowledge to recognize injuries, secure immediate care needed for the injury, and determine the athletes return to competition if a trainer or physician is not available.

Hage and Moore (1981) found in many instances that although a state may require certification for a coach, the actual requirements may be decided by individual school districts who desperately need coaches in order to field teams. In 1981 only eight states

required coaches to have requirements beyond a teaching certificate (Arkansas, Iowa, Minnesota, New York, Oklahoma, Oregon, South Dakota, and Wyoming). Within the coaching community of California there are four different types of coaches:

1. Certified teachers with physical education majors whose college course work included care and prevention of athletic injuries.
2. Certified teachers with no physical education background, who make up about half of the high school coaches.
3. "Walk-on" coaches who are not certified teachers and may or may not be employees of the district, but who are "knowledgeable and competent" in first aid and emergency procedures, coaching techniques, and adolescent psychology. (Hage & Moore, 1981, p. 142)
4. Volunteer coaches who are not reimbursed a monetary reward for services rendered.

One of the biggest problems in California high school sports programs is that the schools cannot recruit enough coaches and for this reason several coaches are walk-ons. California also permits the use of emergency walk-on coaches and to bridge the gap in athletic training expertise, some districts contract with ambulance companies that provide certified athletic trainers or paramedics for health care purposes.

Other states have more rigorous requirements in order to coach. Texas requires coaches to take first aid courses and seminars, but this state has a highly organized athletic trainer's association that provides majority of the health care to athletes. Illinois has strong support for legislation requiring an attendance of college workshops. Coaches

must complete the course prior to applying for a coaching position. Thirty percent of Michigan coaches are non-certified walk-ons, but most school districts require coaches attend athletic trainer workshops. Ohio coaches must meet one of three qualifications to coach: "1) receive a 16 semester-hour certificate in care of athletic injuries from an approved college, 2) take a sport specific course on health and safety of athletes, or 3) attend a continuing education seminar annually to review injury management" (Hage & Moore, 1981, p. 142). No matter what type of coach, or the state in which they coach, coaches should have some knowledge of sports medicine. In some school districts there are certified athletic trainers on staff, but the overlap of athletic seasons or the responsibilities of an athletic trainer off the field may force a coach to function as a health care provider in a given situation.

Hage (1982) also completed a study concerning coach's perceptions of their familiarity of basic sports medicine, and their knowledge and application in handling sports injuries. A random sample of high school coaches in urban, suburban, and rural areas in five geographic locations were interviewed. Telephone interviews were conducted with each football coach to determine if they: 1) allow players free access to water during practice, 2) whether or not they use ice to treat injuries, 3) whether or not they recommend the use of salt tablets, and 4) whether or not coaches gave advice regarding pre-game meals. The results from this study indicated that all coaches use the application of ice for their players' sprains and strains. Coaches also agreed that enough salt may be gained through a well-balanced diet, but coaches did not advise their players against taking a salt supplement. Pre-game meal advice almost unanimously consisted of

carbohydrates, pancakes, and fruit well before game times. The topic that created the greatest difference in responses involved the players' access to water. "For years free access to water has been recommended" (Hage, 1982, p. 160). Not all coaches follow this practice. Some coaches interviewed allow a 10-minute break every hour, whereas, at the other end of the spectrum, one coach stated that his players had no access to water. The majority of the coaches allowed for a water break during periods of heat and humidity.

A difference of opinion in the professional community exists as to who should be responsible for information regarding injury prevention and management. Ray Kavanagh, a Bemidji, Minnesota high school coach, claimed "...it's the coach's responsibility to stay abreast of medical advice for athletes. Coaches should use their common sense. It's for the benefit of the players" (Hage, 1982, p. 164). Whereas Warren Howe, M.D. stated that "getting sports medicine information to the coach is the responsibility of the medical community" (Hage, 1982, p. 164).

Weidner (1989) investigated college preparation for coaches. Twenty colleges and universities offering physical education programs in the Western United States showed that 85% required just one course in athletic injuries. Fifteen percent required no such course at all. It would seem logical to assume that every physical education program preparing coaches should include courses in the care, treatment, and prevention of athletic injuries. Weidner stated, "A minimum of one 3-unit introductory course in the prevention and care of athletic injuries should be instructed by a certified athletic trainer and required of all teaching/coaching option physical education majors" (p. 84).

Liability Issues

"A time bomb is ticking in interscholastic athletics. When it goes off, the sound will be heard around the world. The explosion will come as a verdict against a school district. The school district will be held liable for an athletic injury by assigning the coach to the sport" (Clear & Bagley, 1983, p. 68). Students are more prone to injury in sports than in any other school-related activity. Although in sport there are inevitable injuries, many can be prevented or at least minimized if the coach is knowledgeable about prevention and care of athletic injuries. Clear and Bagley noted that Wisconsin athletes alone incurred over 7,800 injuries which were reported to insurance carriers in 1979-80. This is equivalent to 1 injury per 22 athletic participants. Due to the high rates of injury in athletic events the coach must be knowledgeable in order to avoid an act of negligence, which could lead to the serious issue of liability as seen by a court of law.

> This standard is also based on what the coach should have known about the sport and/or the injury, as well as what he/she actually knew. Three cases illustrate the point:
>
> 1. Misfeasance (doing that which should not have been done).
>
>   A 14-year-old wrestler is asked by his coach to diet down from 152 to 123 pounds. The coach also provided the diet regimen, which consists of 490 calories and 800cc of water daily. After six weeks and a weight loss of 26 pounds, the boy collapsed, is hospitalized for two weeks, and is incapacitated at home for two additional weeks recovering from kidney dysfunction.
>
> 2. Malfeasance (improper performance of a lawful act)
>
>   On the way back to the team bus after a football game, a boy collapses and begins vomiting. He is placed on the bus and transported, along with the rest of the team, back to the school where he is placed on the floor (about 20 minutes later). He does not regain consciousness and is moved to the shower room and covered with a blanket, and induced to breathe ammonia. After nearly two hours, he still has not recovered. His mother is called, and she orders him sent to the hospital. He dies the next day. A court finds the

coaches liable for not securing medical treatment and for applying improper first-aid measures. The coaches should have known the difference between fainting and heat exhaustion, according to the court.

3. Non-feasance (failure to perform a required act)

A coach directs two boys to box three one-minute rounds. He does not give them instructions or asks whether they know how to defend themselves. One of the boys dies from a blow to his temple. The coach is held liable, due to having failed to instruct the boys properly" (Clear & Bagley, 1983, p. 68-69).

A coach should use good judgment, act prudently, have a physician present at all contests, and follow the first-aid handbook (Shroyer, 1982, p. 36).

In a follow up study by Clear and Bagley (1983) it was noted that one out of eight varsity coaches in Wisconsin had no known professional training and /or qualifications for their duties beyond experience and a willingness to serve. In order to decrease the amount of negligence, each school district should hire only those coaches that meet the criteria for being knowledgeable about the sport in which they will coach. Coaches must maintain current knowledge and skill through continuing in-service training.

Model Programs for Injury Management

Porter, Bates, Bachman, and Hoover (1982) stated that many schools lack sufficient funding to support the hiring of a full-time athletic trainer. Therefore, Porter et al. developed a pilot program to train 43 teachers to become certified athletic trainers. The pilot program was initiated in 1976 when few certified athletic trainers were in the high school system. The initial group consisted of 14 women and 20 men and the following year 11 women and 16 men. Teachers were recruited into the program and courses were completed over the summer. The course, outlined by the National Athletic Trainers Association (NATA), consisted of 300 classroom and lab hours of athletic

training instruction. Eighteen certified athletic trainers taught injury prevention, on-field protocol, taping, wrapping, transportation, follow-up care, and organization and administration. Six physical therapists covered therapeutic modalities and rehabilitation while an exercise physiologist taught conditioning and nutrition principles. The course lasted eight hours a day for three weeks for three consecutive summers. Results indicated that only 70% of the teachers successfully completed the program. The primary reason for the dropout rate was the investment of time over the 3-year period. Of the first group of graduates, 55% passed a certification exam. Of the initial graduates ten continue to work as coach/trainer in a high school, three are employed at a junior college as an athletic trainer, and two in a clinical physical therapy setting. The results demonstrated that the program did not do what it intended. Although individuals were educated in injury management, only one forth of the graduates remained employed at the secondary schools, which was the main purpose of the pilot program.

Fifty percent of Wisconsin high schools were surveyed in 1985 by Brad Shermen, ATC, to determine how medical coverage, first aid and initial care of sports injuries, and follow-up care and rehabilitation of sports injuries was handled. Seventy two point five percent of the surveys were returned. Specifically medical coverage was poorly organized with only 52% of the schools having a volunteer physician and only 7.8% of the schools actually contracting a physician. Eight and a half percent of the schools had a certified athletic trainer on staff and in 17% of the schools the coaches were first aid and CPR certified. Sherman implemented a program to help alleviate this problem. The University Hospital Sports Medicine and Fitness Center developed an outreach program

in which 19 schools contracted, twice weekly a visit by an athletic trainer, who cared for athletes, gave educational programs for coaches, athletes, and parents, and covered competitive athletic events. This program provided expert health care that high school athletes may have otherwise gone without.

Later in 1988 Stapka and Kaiser investigated the use of athletic trainers in secondary schools as the solution to injury management. Stopka and Kaiser presented injury statistics and discussed current policies and recommendations to support the need for certified athletic trainers. At the time of the study 636,000 injuries were occurring every year in football alone with only 10% of the high schools employing an athletic trainer. This accounted for one certified athletic trainer per every 5,500 high school athletes. Stopka and Kaiser felt that there were solutions to alleviate this problem. The school could hire a full time trainer, district trainer, teacher/trainer, contracted trainer, or graduate assistant trainer. The benefit of having a certified athletic trainer on staff allowed skilled personnel to respond to accidents, thus placing the athlete, coach, parents, and administration at ease. The use of a certified trainer can decrease the possibility of litigation being brought against schools. Even though athletic trainers are extremely beneficial it must be remembered that they cannot be with every sport at the same time, thus the coach must also be able to assume responsibility for injuries to athletes.

Assisting coaches to be more capable in assuming injury management responsibility is exactly what Hackworth, Jacobs, and O'Neill tried to accomplish in 1983. They determined that volunteer coaches, who had little or no training in injury management, operated most of the youth sports programs in Michigan. Michigan

implemented a pilot program for a random sample of 2,041 youth coaches. The pilot program included a clinic designed to provide coaches with basic knowledge about the prevention, recognition, and care of common sports injuries. Preliminary contacts with the youth coaches revealed a concern about their lack of training. Hackworth et al. developed a 64-page manual for the coaches to carry in their medical kit for immediate referral. During the clinic the coach's attention was maintained by using a variety of methods for presenting information such as lectures, films, demonstrations, and participation. Instructors emphasized that the coach's role was to recognize and treat minor injuries and know when to seek professional help. The study showed that the coaches could benefit from the course and the majority of the coaches felt it should be mandatory for all coaches.

Summary

The review of the literature has consistently demonstrated that coaches have an inadequate level of injury management education (Kenny, 1987; Rowe & Miller, 1991; Sherman, 1985). Coaches perceive that they are not adequately trained for providing first aid and, therefore, do not feel capable of administering emergency medical care (Hage & Moore, 1981; Stapleton et al., 1984; Weidner, 1989). Based on these findings, educating coaches in injury management should increase their knowledge, confidence, and ability to cope with athletic injuries. "The time is ripe for school board officials, principals, teachers, coaches, sports medicine specialists and parents to voice their support for further action that will facilitate the successful implementation of an efficient health care program for the high school athlete" (Kenny, 1987, p. 20).

Chapter 3

METHODS

A Basic Injury Management Clinic (BIMC) was conducted as a means of continuing education for high school athletic coaches. "The purpose of the BIMC was to provide participants with the knowledge and skills necessary to help provide a safe environment for athletes while they are participating in sports and, in an emergency, to help sustain life and minimize the consequences of injury or sudden illness until medical help arrives" (American Red Cross, 1997, p. 33). The 1-day BIMC reviewed such topics as First Aid, Cardiopumonary Resuscitation (CPR), injury prevention, injury management, and procedures used during sudden illness. The American Red Cross instructors for Sport Safety Training provided instruction and practical experience. Participants learned through lectures, discussions, reading, study questions, group activities, and skill practice.

Selection of Participants

Athletic coaches from five San Jose, California area high schools were invited to participate in the study. Specifically, coaches from the Fremont Union High School District were invited to participate. This district included the following schools: Cupertino High School, Fremont High School, Homestead High School, Lynbrook High School, and Monta Vista High School. The coaches either already coached in the district or intended on coaching during the 1998-1999 school year. Male and female coaches represented one of three classifications of professional roles identified by Hage and Moore (1981) and one additional classification:

1. Physical Education / Coach
2. Teacher / Coach
3. "Walk-on" Coach
4. Volunteer (not identified by Hage & Moore)

Regardless of classification, all individuals from each classification were required by California State certification laws to maintain current certification in First Aid and CPR. Participants for the study were certified athletic coaching personnel, who at some point in time have assumed, or will assume to some extent the responsibilities of the certified athletic trainer.

The American Red Cross (ARC) was consulted concerning information needed to conduct the BIMC such as group size, cost, materials needed, dates and location. The Santa Clara Valley Chapter of the American Red Cross determined the clinic group size. The ARC regulated the size of the number of participants (treatment group) based upon a ratio of one instructor per 12 clinic participants (coaches). Twenty-four participants (n=24) were selected to participate in the study and two BIMC's were held concurrently at the same location, in two separate classrooms.

Of those coaches participating in the voluntary pretest, a maximum of 24 participants (n=24) were randomly selected to participate in the BIMC. The number of participants was determined based upon ARC standards and procedures described previously. The coaches who received lower than the criterion score of 80% on the pretest established by the ARC comprised the pool of potential participants who were randomly selected to participate in the study. The last four digits of the participant's

social security number were used as the identifier for each subject. The identifier for the participants who received a score of less than 80% was placed on a folded piece of paper. Twenty-four pieces of paper were selected, alternating each selection into one of two groups (A and B) and those participants were invited to participate in the BIMC. Group A was assigned to participate in one classroom (n=12) and group B to another classroom (n=12). In the case where a coach could not attend the BIMC due to a date or time conflict or a previously scheduled engagement, another subject was randomly selected from the remaining pool of potential participants. If fewer than 24 coaches did not meet the 80% criterion score on the pretest then all were allowed to attend the BIMC. If there were more than 24 coaches who did not meet the criterion score, then a clinic was to be implemented on a later date to meet the needs of those coaches unassociated with this study for more injury management knowledge.

Research Design

The research design that was used was a one-group pretest – posttest design. "This type of research attempted to establish cause-and-effect relationships. That is, an independent variable was manipulated to judge its effect upon a dependent variable" (Thomas & Nelson, 1996, p. 344). In this design the researcher observed pre and posttest scores to see if any change in the knowledge of the participants had occurred that could be directly attributed to the clinical intervention. The independent variable in this study was the American Red Cross Sport Safety Training package. The dependent variable was the scores achieved on the American Red Cross standardized test used with the Sports Safety Training package.

Due to the nature of the research design there were threats to internal validity. "The first threat to this type of design was history. A history threat meant that an unintended event occurred during the treatment period" (Thomas & Nelson, 1996, p. 345). For example, if the participants were studying or taking a class in injury management after the pretest, but prior to the introduction of the independent variable, the ARC training program (BIMC), any changes in posttest scores could not be solely determined to be a function of the treatment received. In controlling for history participants were asked to relinquish any form of education concerning first aid, CPR, injury prevention, injury management, and sudden illness until after the completion of the BIMC in order to keep history effects to a minimum.

Another threat to the internal validity of this study was the effect of multiple testing. Participants tend to learn from taking a test more than once. The test used in the study was "a multiple-choice test, which are considered by testing authorities as the most reliable of the test items" (Thomas & Nelson, 1996, p. 244). In order to compensate for this threat to internal validity the pre and posttest questions were reordered so as not to present the questions in the same order. Statistical regression, selection biases and selection maturation threats to the validity, were controlled through randomly selecting the participants.

Procedures

A memo (Appendix A) concerning the BIMC was used to inform athletic directors at a monthly meeting held on April 1, 1998. The memo concerning the need to implement the BIMC informed the administration of the clinic's time, date, and location.

This format was used so as to confirm support that each athletic director would strongly persuade coaches at their respective schools to attend the voluntary pretest. The investigator inquired as to whether the district would assist with the expenses accrued to operate the clinic. The American Red Cross charged $50 per participant. This fee included: a sport safety training workbook (Stock No. 655551), a sport safety training handbook (Stock No. 655550), class room instruction, and a certificate (Stock No. 653225, 653212, and 653224) for those who passed the Sport Safety Training course.

The athletic directors were to confirm with the researcher the number, type and gender of each coach in their respective athletic departments that intended to participate so that letters, flyers, (Appendix D) and maps concerning the clinic could be mailed out a week prior to the pretest. Information concerning the BIMC was provided so that coaches could plan for the BIMC prior to the start of the next school year.

Pretest

A pretest was administered during the week of June 1-5, 1998 at 3 p.m. in a classroom at each high school on separate days. Cupertino High School was pretested on Monday June 1st followed by Fremont High School on June 2nd, Homestead High School on June 3rd, Lynbrook High School on June 4th and Monta Vista High School on Friday June 5th. Pretesting was completed at each coach's respective school in order to encourage as many coaches as possible. Coaches were informed as to the purpose of the BIMC. Each coach was required to complete an informed consent (Appendix B). The consent form was completed with a signature and a phone number in order to contact participants with pretest results. The last four digits of each coach's social security

number would be used to match test results with the phone number. Under no condition however, would the identifier reveal the identity of the participant. All tests and information were kept confidential and secured. By signing the consent form, the participants also agreed to the terms of participation in the study including, not participating in any other clinics nor reading any information on athletic injury management prior to the BIMC in late August. A demographics survey (Appendix C) developed by the researcher was given to the participants to gain information regarding gender, type of coach, years of coaching experience, sports and athletes' gender coached during the 1998-1999 academic year, educational background, date (month/year) of most recent First Aid and CPR certification, certified athletic trainer/team physician coverage provided for their respective sport, attendance of a seminar, and name of school at which the coach is employed.

During the pretest participants were evenly spaced throughout a classroom. Test instructions were read aloud by the researcher. The pretest consisted of 70 multiple-choice questions covering first aid, cardiopulmonary resuscitation (CPR), injury prevention, injury management, and sudden illness. The standardized ARC pretest was administered within an hour and ten-minute time limit. The questions used in the pretest were an exact replica from the sport safety training instructors manual. Each subject placed the answers to the test questions on a T&E 0200 Scantron by blackening in the appropriate oval with a number 2-lead pencil. Pencils and Scantrons were provided. Upon the completion of the test, each subject gave the researcher all test materials. Scantrons were submitted to the Office of Testing and Evaluation at San Jose State

University. The Office of Testing and Evaluation electronically scored each exam and subsequently provided results to the researcher. The exam, exam results, and informed consents containing the four-digit code subject identifier were kept in a locked filing cabinet in SPX 75 B. Only the researcher and the researcher's advisor, Dr. Susan Wilkinson, had access to this information.

Those coaches who achieved a passing score were issued a certificate of achievement. The investigator mailed certificates to the Athletic Directors of the appropriate schools for distribution. The coaches who scored less than the criterion score of 80% and who have consented to participate in the study were randomly selected to attend the BIMC. The investigator advised each participant by phone of his or her participation in the BIMC. A reminder letter was sent the week prior to the clinic.

Basic Injury Management Clinic (BIMC)

The BIMC was held on Saturday August 1, 1998 at the Physical Performance Institute (PPI) in Los Gatos, California. PPI was chosen since it has two classrooms with space suitable for lecture, class discussion, first aid and CPR skill practice, and was equipped with televisions and videocassette recorders for video presentations. There was also ample room to comfortably complete the posttest. The BIMC date was reserved with the understanding that the PPI facility coordinator would be allowed time to speak to the group of participants concerning the resources that the facility had to offer the coaches and the athletes followed by a tour of the facility. The BIMC began promptly at 8 am with the researcher assisting the coaches to classrooms A and B. Each classroom consisted of one Sport Safety Training instructor and 12 participants for quality

instructional purposes. The American Red Cross instructors gave the Sport Safety Training course introduction, which included a schedule, facility features and rules. Instructors handed out the workbook (Stock No. 655551) and handbook (Stock No. 655550), and gave information regarding the certification process and health precautions. The Sport Safety Training Handbook was used in two ways and was an integral part of the Sport Safety Training course. The handbook was designed to help a coach learn principles of injury prevention and the steps necessary in the administration of first aid for specific emergency situations. The handbook was also a source of information in injury prevention and emergency care. Each section in the handbook guided a coach's actions using step-by-step procedures. The handbook could be easily carried along with the coach in the first aid kit to every sporting event and practice (American Red Cross, 1997). The introduction segment was approximately 20 minutes in length and was followed by the first lesson, Principles of First Aid. The Principles of First Aid section was approximately 25 minutes in length. During this time instructors discussed the prevention of athletic emergencies, provided insight into the coach's role in the Emergency Medical System (EMS), discussed Good Samaritan laws, procedures used to call EMS personnel, check-call-care principles, how to prevent disease transmission, and discussed procedures which require moving the injured or ill athlete. The first lesson allowed for 8 minutes of video presentation, and 9 minutes of activities, which consisted of reading and self-study. After completion, participants would be familiar with the role of a responder and how to help in an emergency. The next lesson, Checking the Injured or Ill Athlete was 40 minutes in length and included discussion and practice skills related

to the lesson. The content included calling for help and caring for either the adult or child athlete. Participants simulated the check-call-care skills for an adult and child. The lesson was 12 minutes of video presentation and 10 minutes allowed for practicing skills, and 6 minutes of activities. After completion, the participant would be familiar with how to check a conscious or unconscious athlete for life-threatening and non-life-threatening conditions. Lesson Three, Breathing Emergencies, consisted of 75 minutes of instruction and practicing how to prevent, and recognize the signals of breathing emergencies, and how to aid the choking athlete. Fifteen minutes of video were viewed, and then participants partnered up and practiced on a mannequin the skills of handling a choking athlete, obstructed airways, and rescue breathing. After completion, participants were familiar with the signals indicating breathing emergencies and how to provide care for an athlete who is having difficulty breathing or is not breathing. Cardiac Emergencies, the next lesson was 65 minutes in length and included instruction on how to live a healthy lifestyle, how to recognize and aid an athlete having a heart attack, and how to perform adult and child CPR. This lesson also included practice time of 30 minutes to apply the instruction into a practical application. Participants practiced the adult and child CPR skills on a mannequin. Upon completion, participants were familiar with the signals indicating a heart attack and how to provide care for a person who is experiencing a heart attack. After Lessons One through Four were completed the first portion of the posttest was administered. Participants were allowed 30 minutes to take the 35-objective multiple choice question exam that asked participants questions pertaining to Lessons One through Four. Answers were submitted using a number 2-lead pencil on an A&E 0200 Scantron.

The researcher provided pencils and Scantrons. After completion of the exam the participants were dismissed for a 1-hour lunch break.

The afternoon session began with a tour of the Physical Performance Institute facility that informed coaches of the services the facility offers and how this can benefit the coach and his or her athletes. After the tour the coaches returned to the pre-assigned classrooms for the last half of the BIMC. The afternoon session began with Lesson Five, Injury Prevention, which consisted of 80 minutes where instruction focused on general causes of injury and illness in athletes, how to prevent injury and illness, coach's responsibilities, preventing specific injury, and guidelines for handling an injury after it occurs. The next lesson included information on injuries to soft tissues. Lesson Six, Injuries to Soft Tissue, was approximately 40 minutes of discussion and practice concerning types of wounds and burns, prevention of wounds and burns, external bleeding, internal bleeding, shock, and how to aid these situations. Lesson Seven, Injuries to Muscles, Bones, and Joints, consisted of 45 minutes of instruction and practice regarding prevention of muscle, bone, and joint injuries, signs of serious injury to muscle, bone, and joint, types of injuries (fracture, dislocation, sprain, strain), and first aid for these conditions, head-neck-and back injuries, signs of head-neck-and back injury and first aid for these conditions. Skills practiced during this lesson included applying an anatomic splint, a soft splint, a sling, and a rigid splint. The last instructional unit, Sudden Illness, lasted 25 minutes and included a discussion of the types of sudden illness, how to prevent sudden illness, first aid for sudden illness, and specific cases (seizure, stroke, diabetic emergency, fainting, vomiting, poisoning, bites and stings, and heat and

cold related emergencies). The posttest covering the afternoon session was given with 40 minutes allowed for the 35-objective multiple choice question test. Answers were given using a number 2-lead pencil on an A&E 0200 Scantron, which was provided by the researcher. Upon completion of the posttest each coach submitted his or her exam to the ARC instructor. To conclude the BIMC all coaches were given an information folder of medical supply catalogs, a first aid newsletter and other resources. Certificates provided by the ARC signified that "on August 1, 1998 the course participant demonstrated competency in each critical skill taught in a specific course, and correctly answered at least 80% of the questions on a final written exam" (American Red Cross, 1997, p. 21). The certificates were mailed to the athletic directors for distribution to each coach.

Statistical Treatment of Data

Both pre and posttests were scored at the San Jose State University Office of Testing and Evaluation. The Office of Testing and Evaluation scored each participant's test based on the answer key submitted by the ARC instructor manual answer key. The Office of Testing and Evaluation provided the mean score, average percent, standard deviation, standard error of measurement, reliability KR-20, total score, frequency, t-score, percentile rank, and a histogram of all scores on both exams. The mean scores on the pre and posttests were compared.

Chapter 4

RESULTS AND DISCUSSION

This study's original intent was to determine how knowledgeable athletic coaches were of sports injury management. Each coach volunteering to participate was required to complete the standardized Sport Safety Training Test (SSTT) from the American Red Cross. In addition, demographic information was collected as well as the completion of an Informed Consent. Any coach receiving a score below an 80% on the test was to be randomly selected to attend a sports injury management clinic to determine if the clinic could improve their knowledge of sports injuries at the time of the posttest.

During the process of data collection it was found that coaches within the proposed school district were reluctant to participate in a Basic Injury Management Clinic (BIMC). This reluctance was evident in previous research as well. Furney (1987) found that while coaches were very positive regarding the need for continuing education, they were not as supportive concerning their own participation in continuing education. The investigator expanded the potential volunteer pool to a broader geographical area within the Central Coast Section (one division of the California Athletic Association based on state high school athletic playoffs). Due to the reluctance of the coaches to participate in the BIMC, requirements for participation in the study were revised to include all coaches who agreed to complete the SSTT. In addition, each coach completed an Informed Consent and demographic survey. The factors in the revised study were: gender of the coach, type of sport coached, type of education,

number of years of coaching experience, and gender of the athlete coached. The revised research questions included:

1. Is there a difference between men's scores and women's scores achieved on the SSTT?

2. Is there a difference between the type of sport coached and the scores achieved on the SSTT?

3. Is there a difference between the number of years of coaching experience and the scores achieved on the SSTT?

4. Is there a difference between the gender of the athlete coached and the scores achieved on the SSTT?

5. Is there a difference between the terminal degree held by the coach and the scores achieved on the SSTT?

Scoring the Data

The American Red Cross gave their permission to use the Sport Safety Training exam with the volunteer coaches in this study. The 60 test questions were subsequently subdivided into three categories: 1) Non-life-threatening, 2) Neutral, and 3) Life-threatening. Three certified athletic trainers reviewed each question and determined which one of the three categories the question should be placed. Any questions that were in disagreement were discussed at a later date until the three athletic trainers were in full agreement. Definitions used to assist the three athletic trainers to determine which category each question was to be subdivided were as follows. A non-life-threatening sport injury involved those injuries where the action taken would not hinder the sick or

injured athlete. A neutral sport injury involved those injuries where the athlete may not be in serious risk of harm, but responding incorrectly could worsen the existing condition, but without risk to the athlete's life. A life-threatening injury was any injury that would put the athlete's life in jeopardy or may be a fatal response to the injury.

There was 100% agreement between the three athletic trainers as to how each question in the SSTT was to be categorized. Twenty-four of the total questions were categorized non-life-threatening, 25 were categorized as neutral, and 11 were categorized as life-threatening.

Coaching Sample

The sample of coaches for this study coached multiple sport teams; therefore, each coach in this study was counted separately for each sport that they coached. Forty coaches representing the Central Coast Section of the California High School Athletic Association participated in this study. Table 1, provides a demographic overview of the positions held by the coaches (n=40) in this study. Fifty-seven percent of the coaching positions in the study were held by males and 43% of the positions were held by females. Of the male coaches 35% coached multiple sports, of which 32% coached non-contact sports, 11% coached low contact sports, and 57% coached contact sports. Twenty-one percent of the male coaches had 0-5 years of coaching experience, 43% had 6-10 years of coaching experience, and 36% had 11 or more years of coaching experience. Twenty-one percent of all the male coaches did not hold a college degree, 61% held degrees in various areas of specialization, 7% held degrees in physical education, and 11% held degrees in biology. Fifty-seven percent of the male coaches coached male athletes while

Table 1 Summary of coaching positions by gender

	Male (n=28) (57%)	Female (n=21) (43%)
Type of Sport		
Non-Contact	9 (32%)	7 (33%)
Low Contact	3 (11)%	8 (38%)
Contact	16 (57%)	6 (29%)
Years of Coaching Experience		
0-5 years	6 (21%)	8 (38%)
6-10 years	12 (43%)	9 (43%)
11 or more years	10 (36%)	4 (19%)
Educational Background		
No College Degree	6 (21%)	4 (19%)
BS/BA Physical Education	2 (7%)	2 (10%)
BS Biology	3 (11%)	3 (14%)
Other BS/BA	17 (61%)	12 (57%)
Gender of Athlete		
Boy	16 (57%)	2 (10%)
Girl	12 (43%)	19 (90%)

43% coached female athletes. Fifty-seven percent of the male coaches were walk-on coaches.

Of the female coaches, only 5% coached multiple sports, of which 33% coached non-contact sports, 38% coached low contact sports, and 29% coached contact sports. Thirty-eight percent of the female coaches had 0-5 years of coaching experience, 43% had 6-10 years of coaching experience, and 19% had 11 or more years of coaching experience. Similar to the male coaches, 19% of the female coaches did not hold a college degree, 57% held degrees in various areas of specialization, 10% held a degree in physical education, and 14% held degrees in biology. Ninety percent of the female coaches coached female athletes while only 10% coached male athletes. Thirty-eight percent of the female coaches were walk-on coaches.

Results and Discussion

Mean scores on the SSTT between men and women coaches were similar. Figure 1, shows that males achieved mean scores of 84% and females 83% on the SSTT. Females performed slightly higher (86%) on the life-threatening questions (n=11) than the male coaches (82%). For the non-life-threatening questions (n=24) males scored 84% and females scored 82%, and on the neutral questions (n=25) males scored 84% while females scored 83%. These results contradict the results of Kenny (1987) who found that females were significantly better trained in paramedical techniques in handling sports injuries than male coaches.

Figure 2, shows the percent score correct for various types of coaches. The "Walk-on" coach scored the lowest in this category with an overall score on the SSTT of

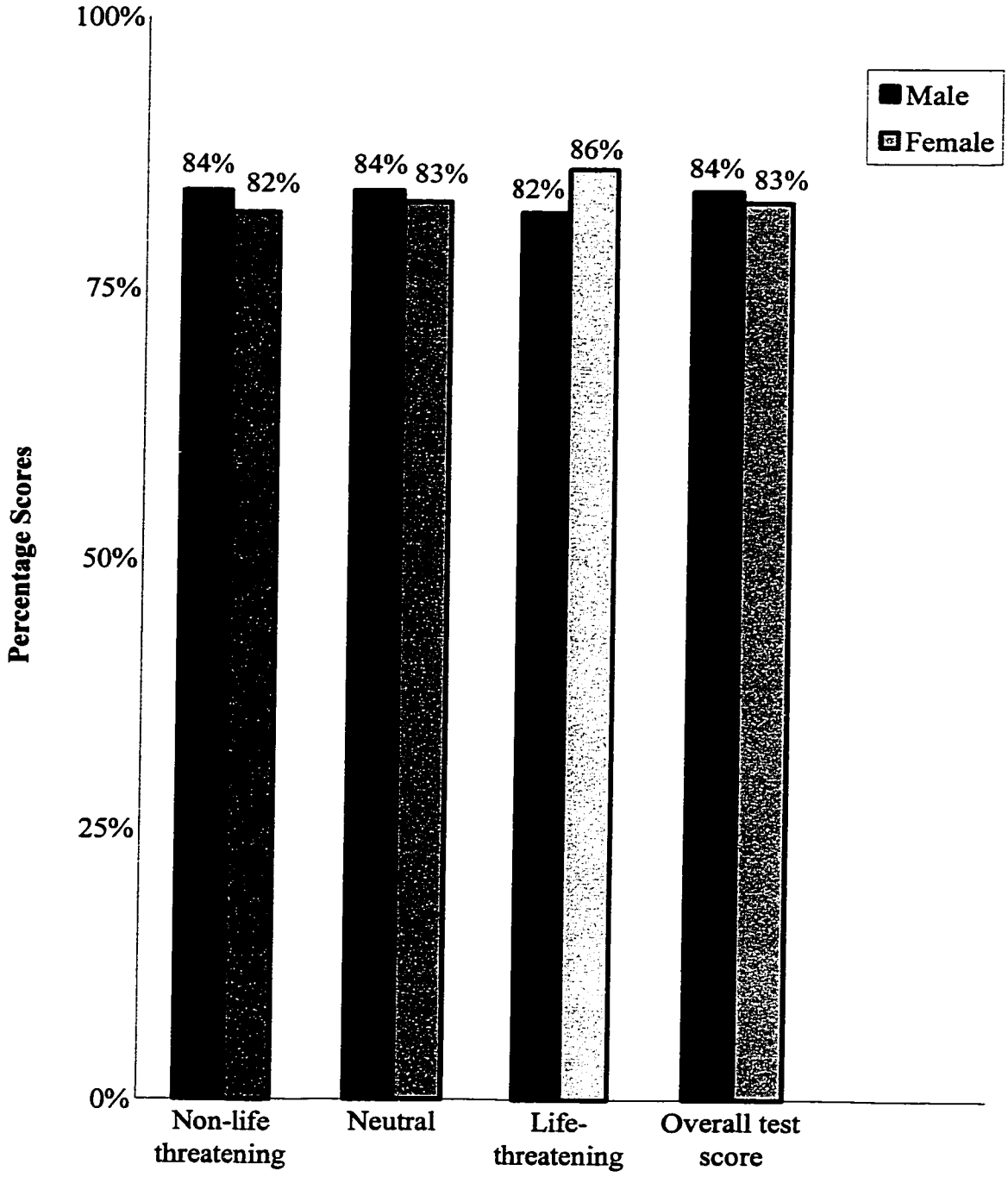

Figure 1. Mean test scores for male and female coaches for each type of test question.

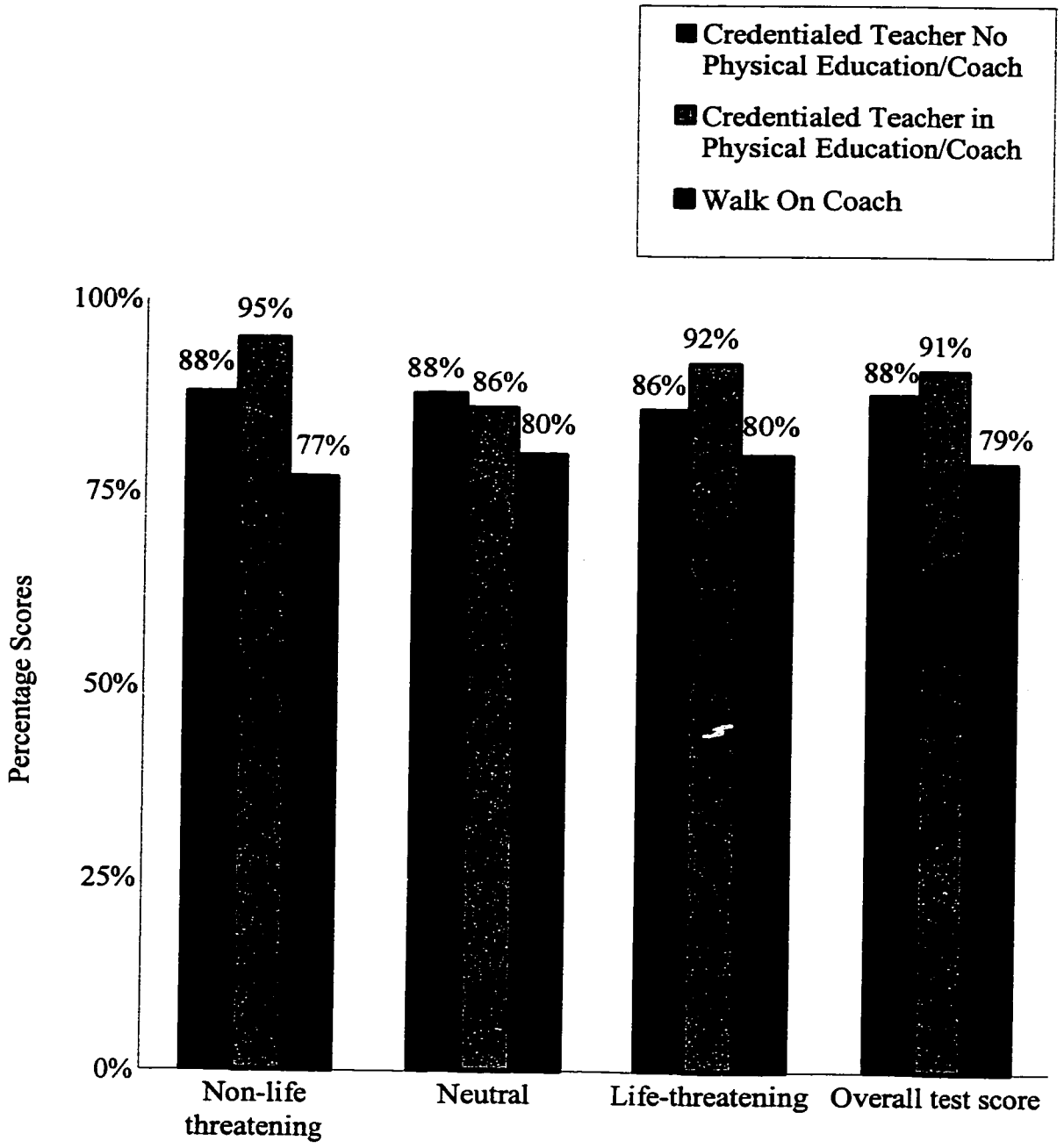

Figure 2. Mean test scores for each type of coach for each type of question.

79%. The "Walk-on" coach scored a 77% for the non-life-threatening questions (n=24), 80% for the neutral questions (n=25), and 80% for the life-threatening questions (n=11). Because many of the walk-on coaches do not have a formal education background their low scores may be a reflection of the lack of that education. Given that there is an 80% standard set by the American Red Cross to pass the SSTT, the mean Walk-on coach score would not have been sufficient enough for a passing score, although 68% of the walk-on coaches did receive an 80% or better on the exam.

The credentialed teacher with no physical education (CTNPE) background who coached, scored the second highest on the SSTT with an 88%. Specifically the CTNPE scored an 88% for the non-life-threatening questions, an 88% for the neutral questions, and an 86% for the life-threatening questions. The group that scored the best in all but one of the categories were the coaches who were credentialed teachers with a physical education background (CTPE). This group's mean overall test score was 91%, with a 95% for the non-life-threatening questions, an 86% for the neutral questions, and a 92% for the life-threatening questions. Because a physical education teacher's preparation in their bachelor's degree provides background in anatomy, biomechanics, physiology, and fitness/nutrition these participants may have been better prepared to answer the questions successfully because they had prior academic knowledge in the content areas asked on the exam. Some undergraduate programs in teaching physical education also require students to take classes in injury management, which would also have an effect on SSTT scores.

Figure 3, shows the percent score on the SSTT and the number of years of coaching experience. The mean score for the 0-5 years of coaching experience group was 81%. This group scored lowest on the non-life-threatening questions (n=24) with a mean score of 79% and an 82% on the neutral questions (n=25). This group scored the highest in the life-threatening questions (n=11) category with a mean score of 86%.

Coaches with 6-10 years of coaching experience had a mean score of 85% on the SSTT. These coaches had a mean score of 84% for the non-life-threatening questions. Coaches with 6-10 years of coaching experience scored highest on the neutral questions with a mean score of 86% and a mean score of 84% on life-threatening questions.

Coaches with 11+ years of coaching experience had a mean test score of 83%. This group's lowest scores were in the categories of life-threatening questions and neutral questions where they had a mean score of 82%. The mean score for non-life-threatening questions was 85%. The coach with most number of years of coaching experience did not achieve the best scores. This group may have been trained in emergency care and handling injuries differently or what some may call "old school methods or ways". Unless these coaches attend classes on injury management to stay current with the changes taking place in emergency medicine, they may put their athletes at risk for serious injury.

Figure 4, shows the percent score on the SSTT and the type of sport coached. Interestingly, the coaches of non-contact sports (NCS) scored highest in the majority of the question categories. The NCS group's mean score on the SSTT was 86%. This group's lowest score was in the category of non life-threatening questions (n=24) where

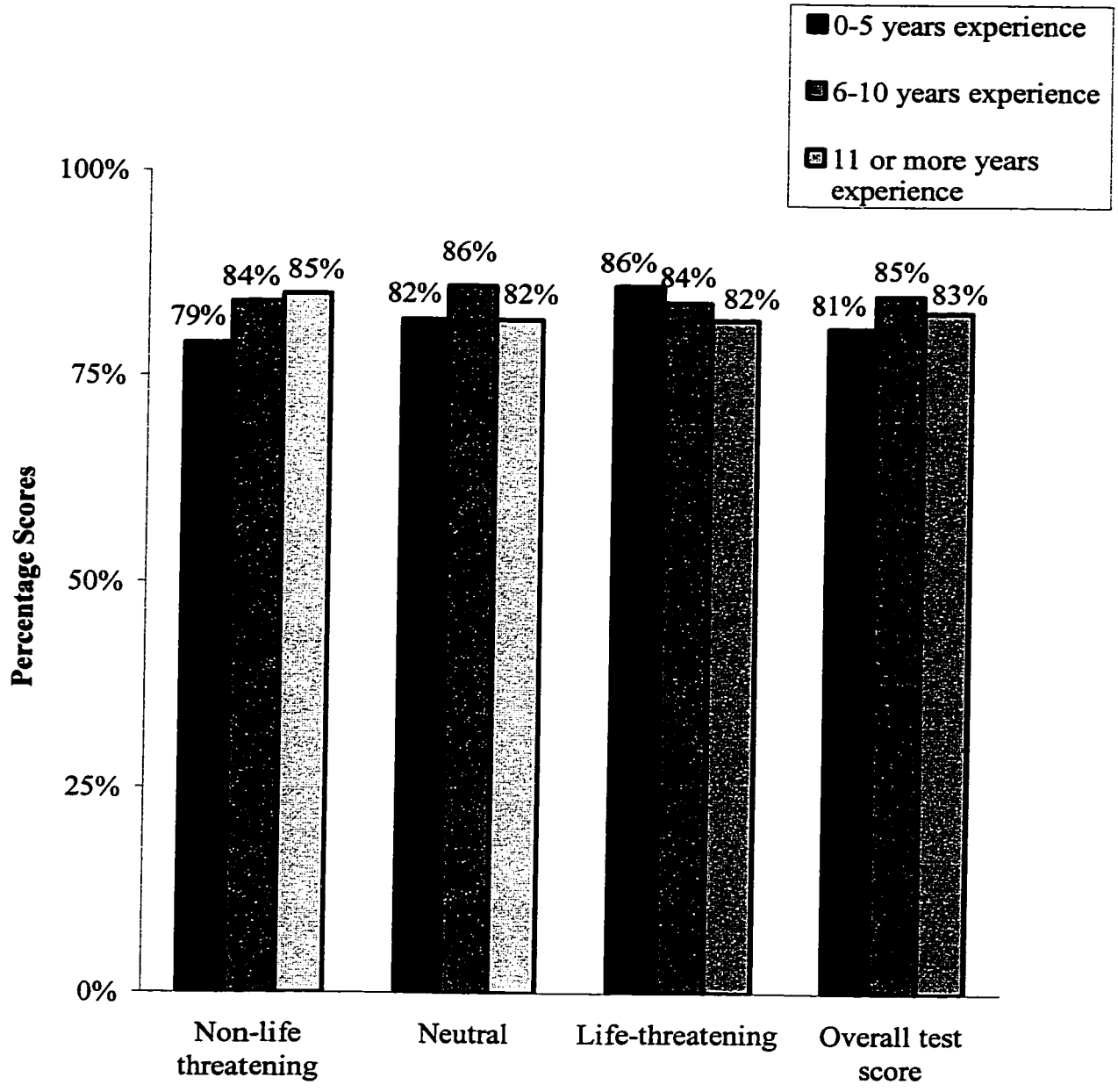

Figure 3. Mean test scores for years of coaching experience for each type of question.

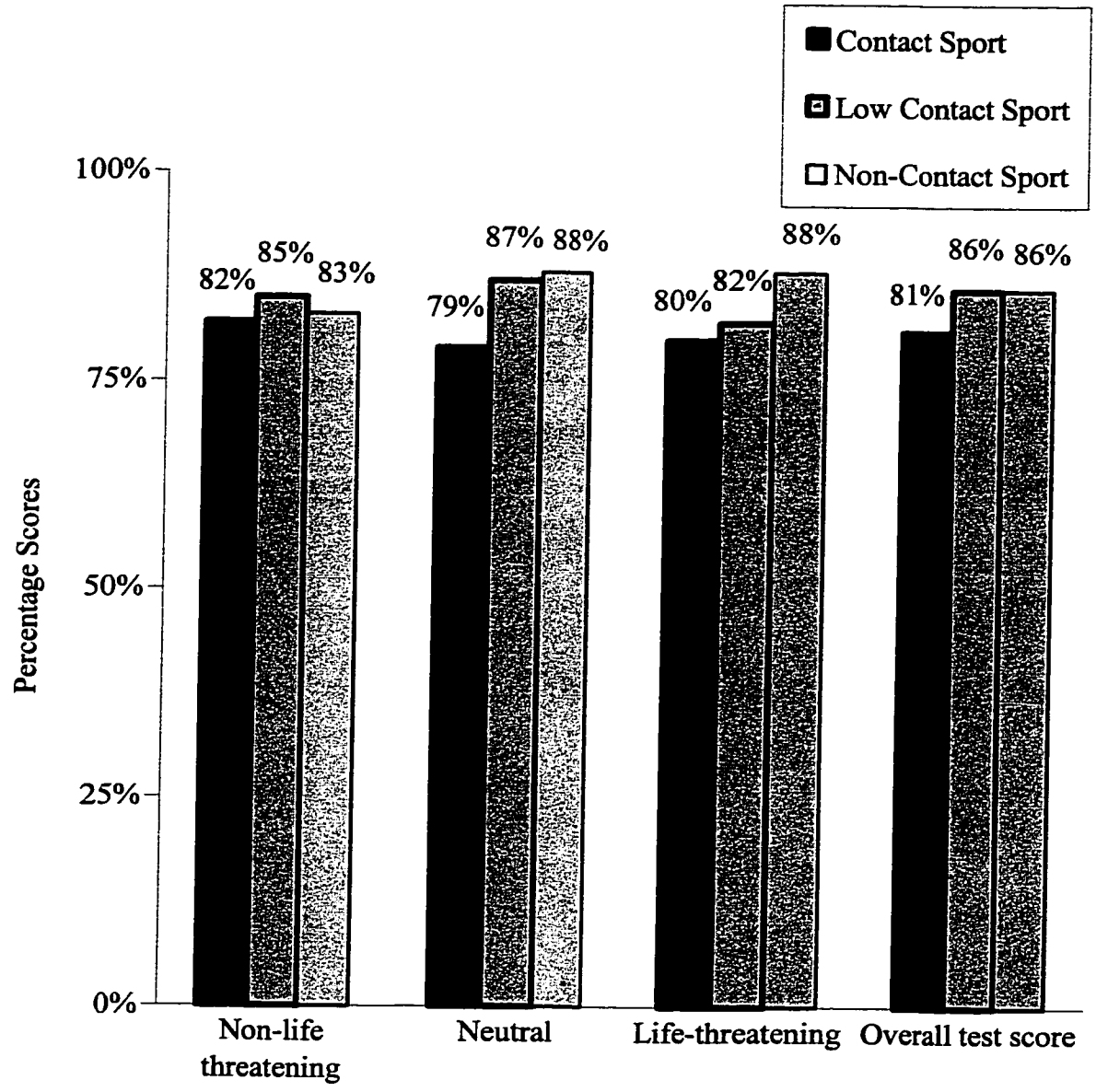

Figure 4. Mean test scores for type of sport coached for each type of question.

they had a mean score of 83%. The mean score for life-threatening questions (n=11) was 88% and an 88% for the neutral questions (n=25).

Low-contact sport coaches' (LCS) mean score on the SSTT was 86%. This group's lowest score was in the category of life-threatening questions where they had a mean score of 82%. The mean score for non-life-threatening questions was 85% and an 87% for the neutral questions.

Interestingly, the mean score for coaches of contact sports (CS) was the lowest in all of the question categories. The CS group's mean score on the SSTT was 81%. This group's lowest score was in the category of neutral questions where they had a mean score of 79%. The mean score for life-threatening questions was 80% and an 82% for the non-life-threatening questions. The scores of the CS group raise serious concerns when one considers the rate of injury that occurs in contact sports. As discussed previously, if a school has an athletic trainer they are most likely to cover the contact sports first, as there tends to be a greater risk for injury due to the nature of the sports. Contact sport coaches however, must remember that even though athletic trainers are extremely beneficial, they can not be with every sport at the same time, thus the coach must also be able to assume injury management responsibilities when athletic trainers are not available.

Figure 5, shows how coaches of each contact sport (football, basketball, and soccer) in this study scored on the SSTT. Although many of the contact sport coaches scored well on the SSTT, soccer coaches scored very poorly. The mean overall test score for the soccer coaches was 73%. The soccer coaches mean score was 72% on the

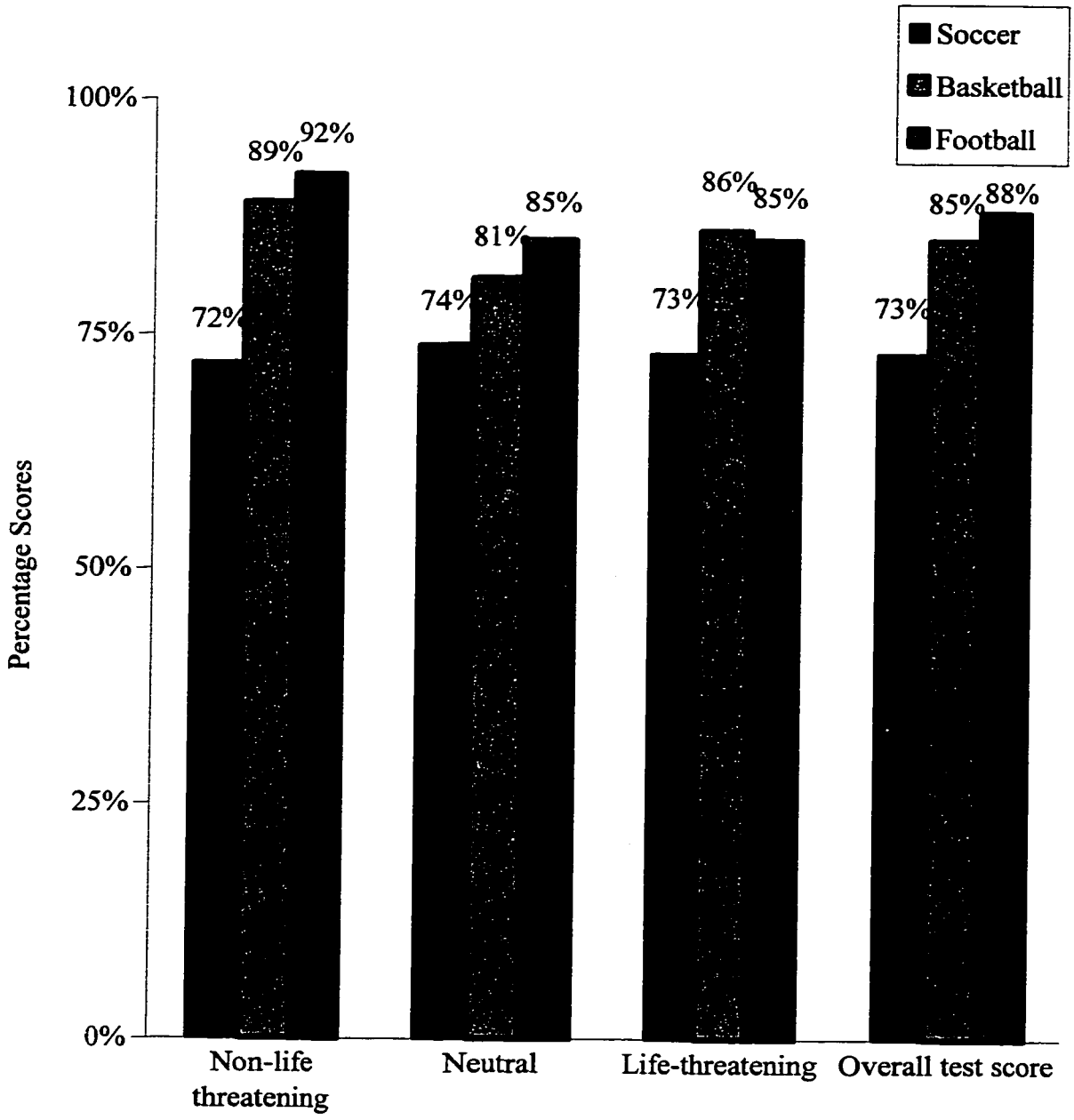

Figure 5. Mean test scores for coaches coaching contact sports for each type of question.

non-life-threatening questions (n=24), 74% on the neutral questions (n=25), and 73% on the life-threatening questions (n=11). By the standards set by the American Red Cross (80% passing score) soccer coaches did not successfully pass any component of the SSTT. If these coaches were to have taken this exam at the beginning of their soccer season and did not pass, they would not be allowed to coach. One possible explanation in this study for the extremely low scores involves one coach not speaking English as a first language. Because there may have been a language barrier in interpreting the questions this coach scored very poorly. However, the other seven coaches in this group also scored extremely low. Their test scores ranged from 50% to 93%. As the researcher-and-athletic trainer, the soccer scores are quite unsettling. Soccer games are primarily played during the middle of a weekday afternoon when an athletic trainer has to assist other teams prior to practice and before away school competitions. These competing responsibilities mean that an athletic trainer may not be at the soccer game from the beginning to the end. Basketball and football games, however, are played during evening hours and/or on weekends so the athletic trainer is more available to be present for the entire event.

The scores on the SSTT were also observed based on the type of education obtained by each coach. Education was comprised of four categories: 1) no college education (NC), 2) college education-general (CG), 3) college education-biology (CB), and 4) college education-physical education or recreation (CPER). Figure 6, shows the

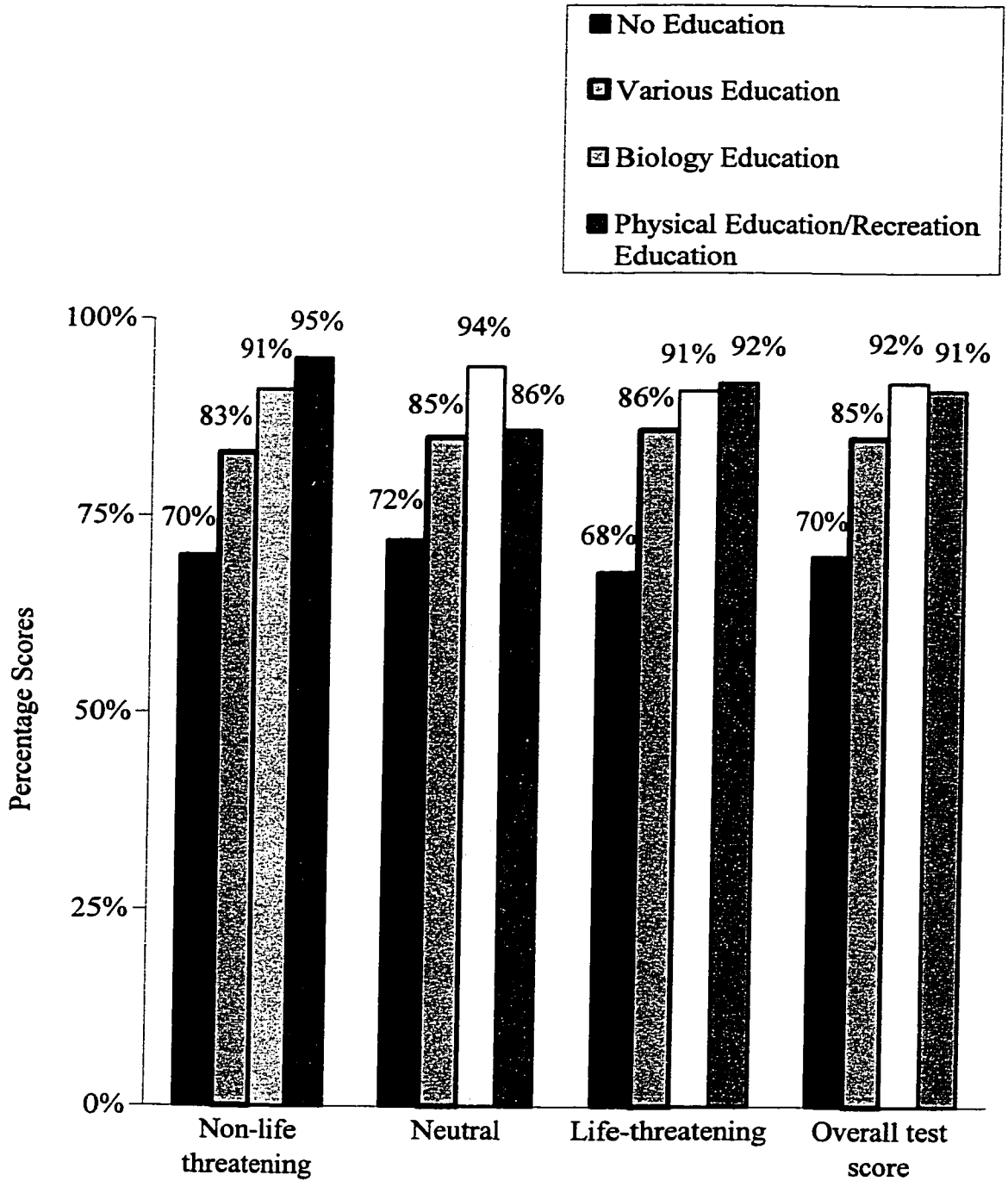

Figure 6. Mean test scores for level and type of education for each type of question.

scores for the mean SSTT for the various educational groups. The overall mean score for the NC group was 70%. The mean score for the NC group for the non-life-threatening questions (n=24) was 70%, 72% for the neutral questions (n=25), and 68% for the life-threatening types of questions (n=11). Given the 80% passing standard, these scores would not be sufficient for the coaches to continue coaching without further training and testing. The mean score for coaches with an advanced education (college degree, excluding biology, physical education and recreation) scored 10% higher than coaches with no college education in all categories. The CG group's mean score for the SSTT was 85%. The mean score for the CG group for the non-life-threatening questions was 83%, 85% for the neutral questions, and 86% for the life-threatening types of questions.

Coaches with a bachelor's degree in biology had a mean score of 92% on the SSTT. The mean score for the CB group for the non-life-threatening questions was 91%, 94% for the neutral questions, and 91% for the life-threatening types of questions. It can be speculated that the knowledge these coaches (biology teachers) gained in their undergraduate degrees in biology, particularly in Anatomy and Physiology has aided their ability to be successful in the SSTT.

The last type of education was the coach who had undergraduate degrees in physical education or recreation. These coaches have specifically studied how the human body operates, sport, and injury management. The results show that the mean score on the SSTT for the CPER group was 91%. The mean score for the CPER group for the non-life-threatening questions was 95%, 86% for the neutral questions, and 92% for the life-threatening types of questions.

Because many factors interact data were analyzed by combining factors such as gender, experience, and type of sport. Data was analyzed by observing different combinations of factors that might give an indication of the combinations of factors that need to be explored further. The combination of factors that produced both the highest and lowest scores on the SSTT was gender and years of experience as seen in Figure 7, Females with 11 or more years of experience overall mean score on the SSTT was 92%. The mean score for this group for the non-life-threatening questions (n=24) was 90%, 93% for the neutral questions (n=25), and 93% for the life-threatening types of questions (n=11). Of these coaches two were physical education instructors and two were biology teachers. Interestingly, all of these coaches coached a non-contact sport.

To the contrary, male coaches with 11 or more years of experience scored the lowest on the SSTT with a mean score of 80%. The mean scores for these coaches were 83% for non-life-threatening questions, 78% for the neutral questions, and 78% for the life-threatening questions. Over half of these coaches had no formal education beyond high school and coached contact sports. Again, it is clear that a major concern exists for the performance of these coaches if confronted with a life-threatening situation on the field.

Combinations of education and years of experience in coaching were also analyzed. These results were interesting from the perspective that the SSTT scores were consistent among coaches with the same education level, even when years of coaching were taken into consideration. All coaches without a college education scored poorly. Coaches without a college education who had 0-5 years of experience and 11 or more

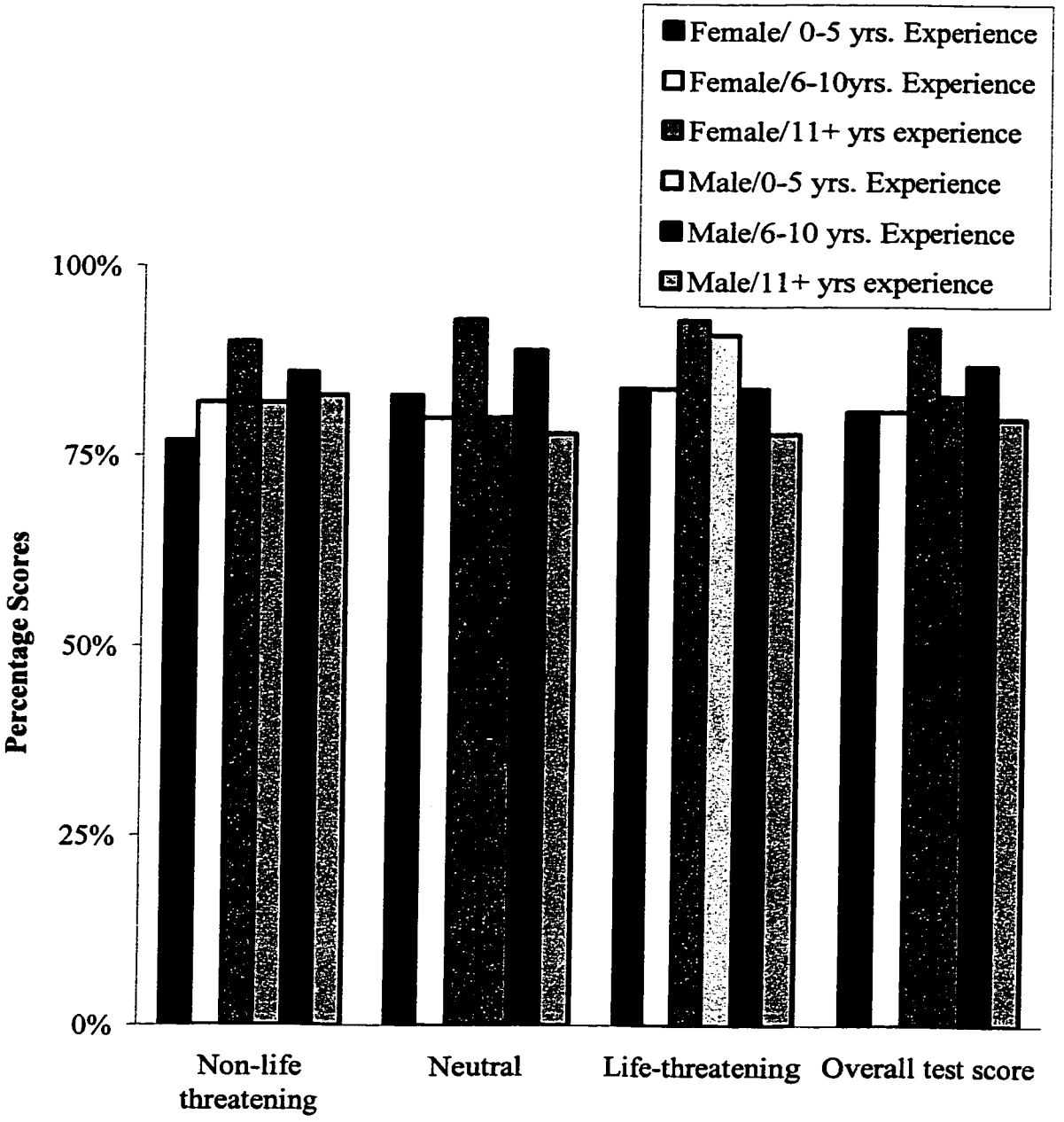

Figure 7. Mean test scores for gender of coach and years of experience for each type of test question.

years of experience had a mean score on the SSTT of 72%. Coaches with 6-10 years of experience with no college education had the lowest mean score of 58% on the SSTT.

In Figure 8, coaches with the fewest years of coaching experience had a mean score of 72% on the SSTT, with a mean score of 75% neutral questions (n=25), 79% life-threatening questions (n=11), and a mean score of 67% for non-life-threatening questions (n=24), whereas the coaches who had been coaching the longest (11 or more years of experience) score 72% on the SSTT, with a mean score of 74% neutral questions, 62% life-threatening questions, and a mean score of 74% for non-life-threatening questions. None of these scores meet the standard passing score of 80% on the SSTT. It was surprising that coaches with 11+ years of experience had a mean score of 62% on the life-threatening questions. These scores could be due to the lack of continuing education in injury management as well as the ease for which some coaches receive certification cards without having to pass the written test.

Coach's gender, team's gender and type of sport coached were also analyzed. Female coaches who coach females in a contact sport scored very similar to male coaches who coach males in a contact sport. In Figure 9, females had a mean score of 83% on the SSTT, with a mean score of 79% neutral questions (n=25), 85% life-threatening questions (n=11), and a mean score of 85% for non-life-threatening questions (n=24). Males had a mean score of 84% on the SSTT, with a mean score of 84% neutral questions, 81% life-threatening questions, and a mean score of 87% for non-life-threatening questions. Male coaches who coach females in a contact sport have the lowest SSTT scores given coaching gender, athlete gender and type of sport. Male

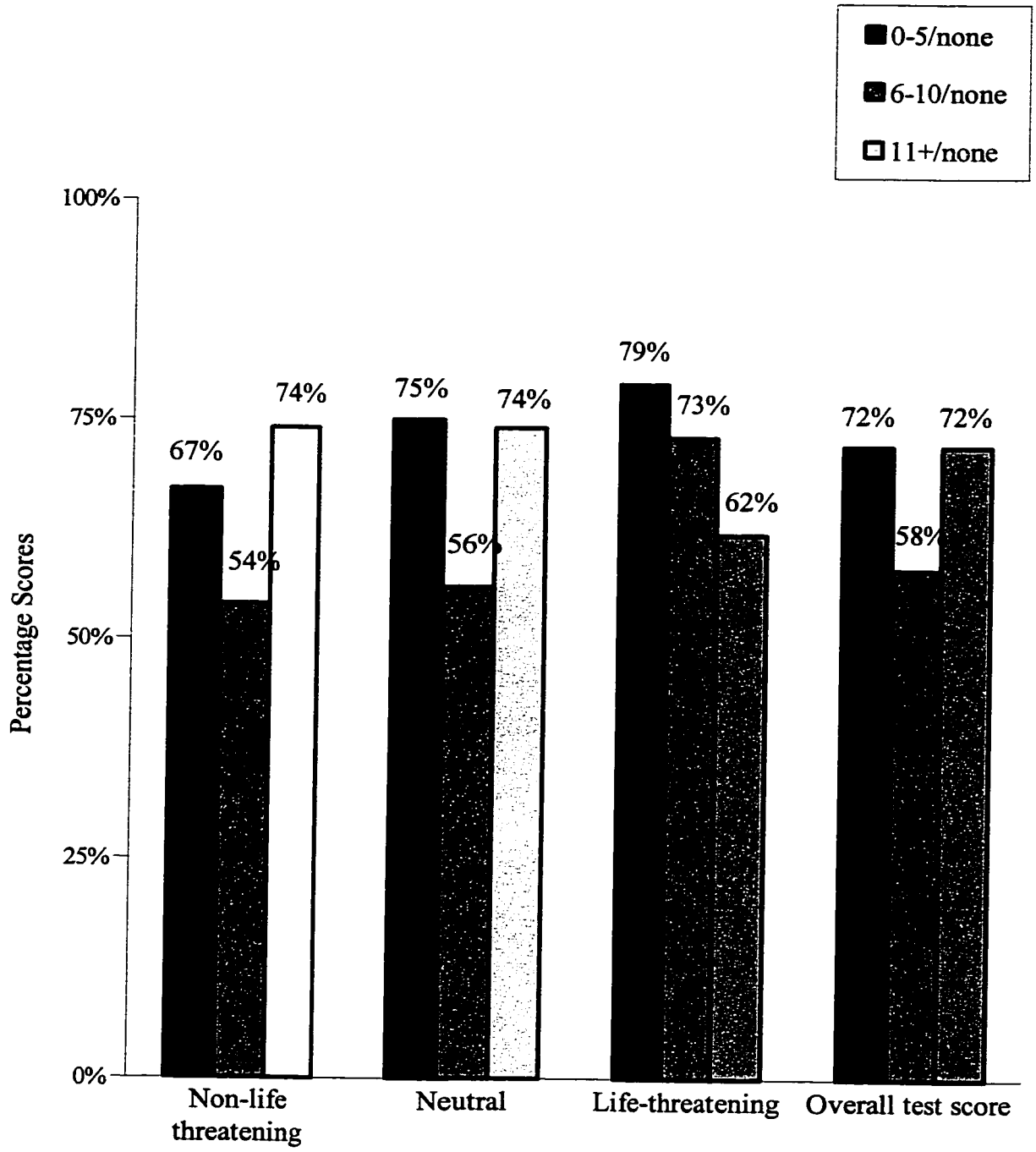

Figure 8. Mean test scores for years of coaching experience and no education for each type of test question.

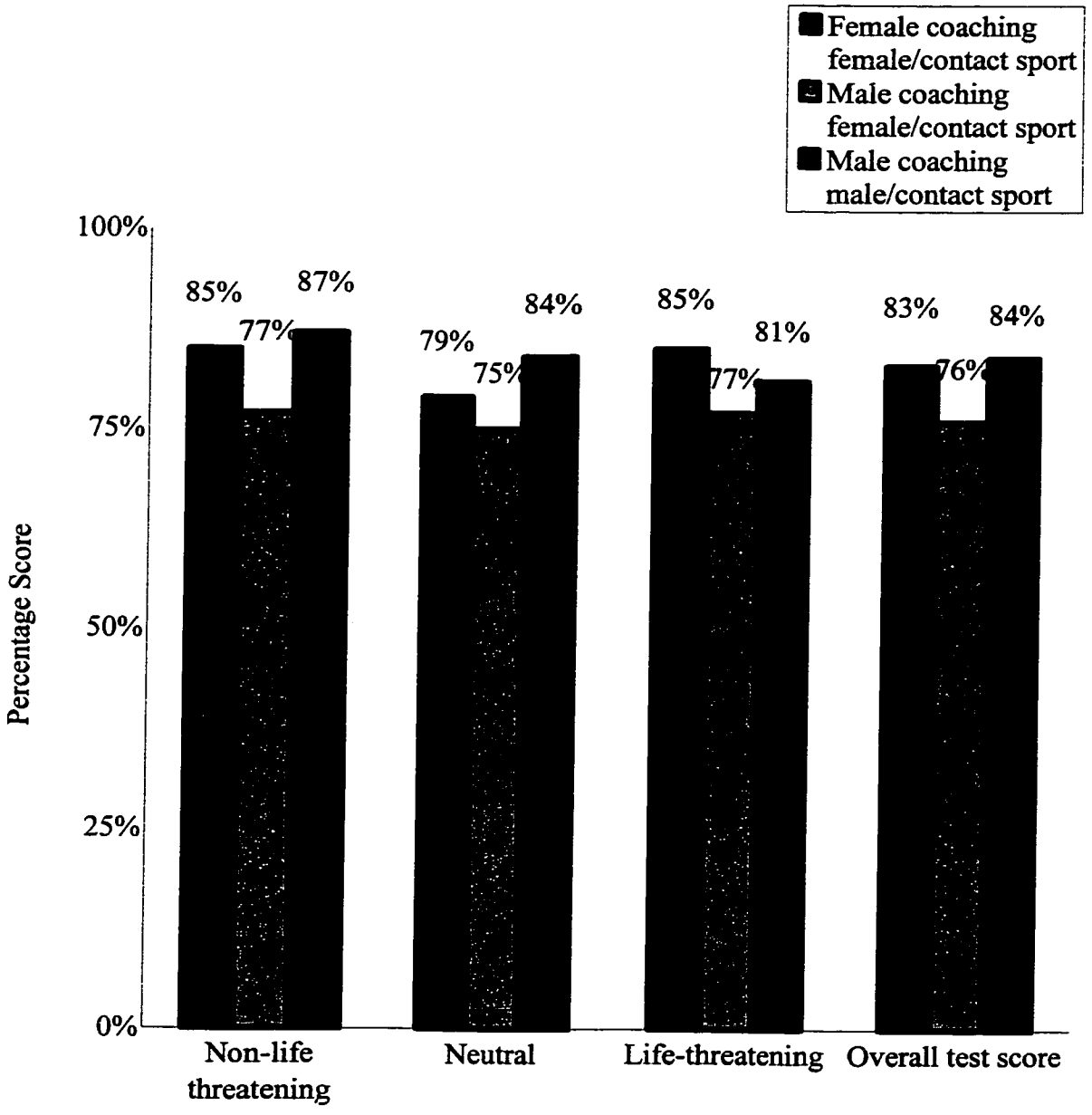

Figure 9. Mean test scores for gender of contact sport team and gender of coach for each type of question.

coaches who coach females in a contact sport had a mean score of 76% on the SSTT, with a mean score of 75% neutral questions, 77% life-threatening questions, and a mean score of 77% for non-life-threatening questions.

Chapter 5

SUMMARY & CONCLUSIONS

High school athletic programs are a growing industry where injury remains inevitable. No regulations imposed on games and activities can make sports safe to the extent that injuries will not occur. Injuries are certain to occur because of the nature of sports and athletics. For this reason, a coach must be able to recognize the difference between life-threatening and non-life-threatening situations that occur with athletes while in their care. A coach must know how to respond responsibly and legally in each case. To accomplish this, a coach must have basic knowledge of injury management and be able to recognize types of injuries so that the coach may respond appropriately to each situation, secure immediate care, if needed, determine whether or not the athlete may return to competition, and to what extent returning to competition will have on the health of the athlete (Haines, 1984). In this study, 25% of all coaches who completed the SSTT did not know basic injury management information. Specifically, coaches without teaching credentials and walk-on coaches performed inadequately. Overall men and women performed similarly on the SSTT, but male coaches with 11 or more years of coaching did not achieve the standard level of performance.

Conclusions

The following conclusions can be drawn from this study:

1) Men's and women's mean scores on the SSTT were similar.
2) Walk-on coaches mean test scores were the lowest on the SSTT.
3) Credentialed teachers with a physical education background mean test score were the

highest on the SSTT.

4) Coaches with college degrees in Biology and Physical Education or Recreation scored the best on the SSTT.

5) Coaches with 6-10 years of experience scored the best on the SSTT.

6) Contact sport coaches need to be educated in injury management, especially soccer coaches who, in this study, had the lowest mean score on the SSTT.

7) Football coaches are the most prepared to handle an injury as far as contact sport coaches are concerned on the SSTT.

8) Coaches without a college degree scored extremely low on the SSTT, while coaches with either biology or a physical education/recreation degree scored the best on the SSTT.

9) Females with 11 or more years experience scored the best, while male coaches with 11 or more years of experience scored the lowest on the SSTT.

10) Coaches with no education scored poorly no matter how many years of experience.

11) Coaches who coach their same gender score higher than the male coach who coaches the female athlete.

Recommendations for Future Research

Based on the results of this study the following recommendations for future research can be made.

1) As a part of the safety and injury management certification process required in the state of California, future studies need to investigate the process by which coaches become re-certified in sport injury management.

2) Future studies need to investigate how written or on field injury simulations could be given to coaches to determine how accurately a coach responds to an injury situation.

3) Future studies should investigate if re-certification for coaches were to occur randomly throughout the year would a coach's knowledge of sport injury management improve.

4) Future studies should evaluate coach's retention of the materials tested on the American Red Cross First Aid and CPR exams.

5) In this study, the researcher found that coaches were not cooperative in taking the sports injury management test, even though it is required by law. A future study should explore the opportunities and barriers that encourage and discourage coaches from participating in the re-certification process.

6) Future studies should investigate coach's knowledge at various age levels (youth, middle school, freshmen sports, junior varsity sports, and varsity sports).

7) A future study should investigate the various re-certification methods that are being used in various school districts from a variety of geographical locations.

Recommendations to Athletic Administrators

Based on the results of this study the following recommendations can be made to athletic administrators and professional organizations.

1) Serious consideration should be given to whether a coach should have a teaching credential in order to coach.

2) Serious consideration should be given to whether a coach should have to pass a professional exam involving sport injury management.

3) Athletic Directors should publicize and encourage or make mandatory continuing education programs for coaches such as sports injury management workshops.

4) Schools should host in-service presentations or clinics for coaches in sports injury management.

5) It is important to recognize that not all high school athletic trainers can be present at all practices and competitions. Athletic directors must take seriously their obligation to provide a safe environment for all athletes. This may require that coaches be more prepared to deal with sports injury management, emergency first aid procedures, and cardiopulmonary resuscitation.

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APPENDIX A.

Memo to Athletic Directors

April 1, 1998

To: Athletic Directors
Cc: Judith Foster, Mary Stone, JoAnn Laird
Fr: Charity L. Perdew A.T., C

Re: Basic Injury Management Clinic

I would like to introduce a new program into our district called the American Red Cross Sport Safety Training Course, which is sponsored by the United States Olympic Committee. I am concerned for the safety and well being of our athletes, just as the coaches are. However I feel there is a lack of knowledge pertaining to the management of athletic injuries until a medical professional can see the athlete. This course will increase awareness, knowledge, and efficacy of the high school athletic coach.

In a previous survey study by Redfearn results showed that only 44% of the coaches felt they had the skills necessary to manage a medical emergency. Of greater concern was the fact that 28% of the coaches said that a life threatening injury had occurred to an athlete while they were coaching. I would hope that 100% of our coaches would feel prepared to handle a sports injury. That is why I would like you, the Athletic Director, to support this clinic and encourage all of your coaches to attend.

There will be an initial pretest lasting approximately 70 minutes to give each school an idea of how their coaches rank. This will tentatively occur June 1st through the 5th using the schedule below. (Even if you do not wish to attend the clinic, your attendance at the pretest will be highly appreciated and be of significant importance.)

June 1	Cupertino	3 PM
June 2	Fremont	3 PM
June 3	Homestead	3 PM
June 4	Lynbrook	3 PM
June 5	Monta Vista	3 PM

The coaches that wish to take the Sport Safety Training Course will be invited to do so at the Physical Performance Institute of Los Gatos on August 1st (tentatively). If there is enough of an interest another clinic will be held on the 15th at the same location. Each clinic will be limited to 24 coaches so as to allow for proficient instruction. The course will begin at 8 AM and will break one hour for lunch and a tour of the Physical Performance Institute, the clinic will resume and end at approximately 6 PM. The course

is $50 unless the coach needs to be recertified in which case the district has agreed to pick up the expense. This covers the cost of instruction, a workbook, and a handbook. In completing the course successfully one can become certified:

Sports Safety Training	valid	3 years
Adult CPR	valid	1 year
Child CPR	valid	1 year

Results will be disclosed at an Athletic Director's meeting sometime during the fall of 1999 upon request.

All I am asking is that you view this as a benefit to your district and support and encourage your coaches' attendance. If you have any additional questions or comments please feel free to call me at (408) 366-7631(M.V. training room) or at home (408) 241-6206. Thank you for your valuable time and assistance in making the athletic field/court a safer place.

APPENDIX B.

Informed Consent Form

Agreement to Participate in Research

Responsible Investigator: Charity Lynn Perdew (principle investigator)
Title of Protocol: A Coaches' Clinic For Basic Injury Management

You are invited to participate in a research study designed to test the knowledge of high school athletic coaches before and after a Basic Injury Management Clinic. The purpose is to provide coaches with the knowledge and skills necessary to provide a safe environment to child and adult athletes while they are participating in sports and, in an emergency, to help sustain life and minimize the consequences of injury or sudden illness until medical help arrives. (American Red Cross)

I understand that:

1. I have volunteered to participate in a research study to examine the effects of a Basic Injury Management Clinic on posttest scores as compared to pretest scores.

2. I will be asked to complete an agreement to participate in the research, a demographics survey, and take a pretest to be given at my coaching location, during the week of June 1st through the 5th.

3. I will be asked to participate in the Basic Injury Management Clinic on August 1, 1998 at the Physical Performance Institute of Los Gatos in Los Gatos, California from 8 A.M. until approximately 6 P.M. At this time I will be learning about first aid, CPR, injury prevention, injury management, and sudden illness through professional lecture, videotapes, and hands on skills.

4. There are no risks or discomforts anticipated or foreseen for the participants.

5. The possible benefits of the study for the participants are:
   *help coaches identify and eliminate potentially hazardous conditions
   *help coaches recognize emergencies
   *allow coaches to make appropriate decisions for first aid care

Participant Initialize:_____

6. The results from this study may be published, but any information from this study that can be identified with me will remain confidential and will be disclosed only with

my permission or as required by law. A four-digit code will be required on all materials so that test results may be sent to the proper individuals. The last four digits of the participant's social security number can be used for this or any other four-digit code of choice. The code will be kept confidential and under no circumstance will the codes be kept with the test materials.

7. I will not take part in any other class, seminar, or lectures that may hinder the outcome of this study. I will refrain from reading articles concerning injuries and first aid measures so that the posttest results will be a true measure of the Basic Injury Management Clinic.

8. Any questions or concerns with respect to this study may be addressed to Charity L. Perdew (researcher) by calling (408) 241-6206. Complaints regarding the research may be presented to James Bryant, Ph.D., Chairman of the Department of Human Performance at (408) 924-3010. Questions or concerns about research, participants' rights, or research related injury may be presented to Serena Stanford, Ph.D., Associate Vice President of Graduate Studies and Research, at (408) 934-2480.

9. My consent is given voluntarily and free of any constraint. As a participating participant I may refuse to participate in the study or in any part of the study. I am free to withdraw at any time without prejudice to my relations with San Jose State University, any other participating institutions and/or individuals.

Having read the information provided above, I have made a decision whether or not to participate. My signature indicates that I will participate.

_____ _____

Participant's Signature Date

_____

Print Name

_____

Four Digit Code

APPENDIX C.

. Demographics Survey

Please provide the following information in the indicated spaces.

4 Digit Code (indicated on consent form)_____

1. Gender: M F (circle one)

2. Type of Coach:

_____ Certified teacher with physical education major / coach

_____ Certified teacher with no physical education background / coach

_____ "Walk-on" coach

_____ Volunteer coach (no pay obtained for coaching services)

3. Years of coaching experience: _____

4. Sport(s) and athletes' gender(s) coached in the 1998-99 academic year

	SPORT	GENDER
Fall	_____	_____
Winter	_____	_____
Spring	_____	_____

5. Educational background

Do you have a B.S. or B.A.? Y N (circle one)

If yes, what was your major? _____

Do you have an additional degree? Y N (circle one)

If yes, in what field? _____

Please specify any additional first aid or emergency medical training you have.

(EMT, ATC, etc.)

_____

6. Date (month / year) of most recent certification in first aid _____

   CPR _____

7. Does the high school where you coach:

   Have a certified athletic trainer? Y N (circle one)

   Have a team physician? Y N (circle one)

8. Have you ever attended a seminar on injury management? Y N (circle)

   If yes how long ago was the seminar?_____

9. Name of your school at which you coach?_____

APPENDIX D.

Information Flyer

Please post for coaches

Basic Injury Management Clinic (BIMC)
Educational Clinic for F.U.H.S.D. Athletic Coaches

What: A program for sports coaches to provide the knowledge and skills necessary to help provide a safe environment for athletes while they are participating in sports and, in an emergency, to help sustain life and minimize the consequences of injury or sudden illness until medical help arrives.

Content: The Sport Safety Training Course will include:
** Adult and Child CPR (valid 1 year)
** First Aid (valid 3 years)
** Injury Prevention
** Injury Management
** Sudden Illness
** Tour The Physical Performance Institute of Los Gatos (P.P.I.)

Date & Time: Saturday, August 1, 1998 8:00 AM – 7:00 PM

Location: Physical Performance Institute
555 Knowles Drive Suite 100
Los Gatos, CA 95030
(408) 866-4059
Classroom A & B

Fees: Newly hired and non-certified participants $0
Clinic will be paid for by the Fremont Union High School District

Certified Participants $50

** fees include a handbook, workbook, instruction and certificate

Registration: In order to be considered for the clinic you must take the pretest and sign the informed consent to participate. Call (408) 241-6206 for more information.

Pretest:

Cupertino High School	Monday, June 1, 1998	3:00 PM
Fremont High School	Tuesday, June 2, 1998	3:00 PM
Homestead High School	Wednesday, June 3, 1998	3:00 PM
Lynbrook High School	Thursday, June 4, 1998	3:00 PM
Monta Vista High School	Friday, June 5, 1998	3:00 PM

San José State
UNIVERSITY

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Fax: 408-924-2477
E-mail: gstudies@wahoo.sjsu.edu
http://www.sjsu.edu

TO: Charity L. Perdew
2008 Hoover Dr.
Santa Clara, CA 95051

FROM: Serena W. Stanford Serena W. Stanford
AVP, Graduate Studies & Research

DATE: July 20, 1998

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Effects of a Basic Injury Management Clinic on Coaches' Knowledge of Injuries"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Serena Stanford, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.